Standing Committee
for Economic and Commercial Cooperation
of the Organization of Islamic Cooperation (COMCEC)

COMCEC

Facilitating Smallholder Farmers' Market Access in the OIC Member Countries

COMCEC COORDINATION OFFICE
September 2014

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ACKNOWLEDGEMENTS

This report has been commissioned by the COMCEC Coordination Office to the project team led by Mona Sur from the World Bank. Views and opinions expressed in the report are solely those of the authors and do not represent the official views of the COMCEC Coordination Office, World Bank or the Member States of the Organization of Islamic Cooperation. Excerpts from the report can be made as long as references are provided. All intellectual and industrial property rights for the report belong to the COMCEC Coordination Office. This report is for individual use and it shall not be used for commercial purposes. Except for purposes of individual use, this report shall not be reproduced in any form or by any means, electronic or mechanical, including printing, photocopying, CD recording, or by any physical or electronic reproduction system, or translated and provided to the access of any subscriber through electronic means for commercial purposes without the permission of the COMCEC Coordination Office.

ACRONYMS AND ABBREVIATIONS

ASCU	Agricultural Sales Cooperative Unions (Turkey)
COMCEC	Standing Committee for Economic and Commercial Cooperation
ECA	Europe and Central Asia
EEC	European Economic Community
EU	European Union
FAO	Food and Agriculture Organization
FDI	Foreign direct investment
FOB	Free on board
GAP	Good Agricultural Practice
GDP	Gross domestic product
GES	Growth Enhancement Scheme (Nigeria)
GMP	Good Manufacturing Practice
GNI	Gross national income
ha	Hectare
HACCP	Hazard Analysis Critical Control Point
HIV-AIDS	Human Immunodeficiency Virus – Acquired Immunodeficiency Syndrome
INCAJU	Instituto Nacional do Caju (National Cashew Institute)
Int. $	International dollars
ISO	International Organization for Standardization
JFDA	Jordan Food and Drug Administration'
KCA	Kyrgyz Center of Accreditation
kcal	Kilocalories
KGS	Kyrgyzstani som
MENA	Middle East and North Africa
MFO	Microfinance organization
MT	Mozambican metical
nes	Not elsewhere specified
NGO	Non-governmental organization
OECD	Organisation for Economic Co-Operation and Development
OIC	Organization of Islamic Cooperation
PSE	Percentage support estimate
R&D	Research and development
SACCO	Savings and credit cooperative
SSA	Sub-Saharan Africa
UAE	United Arab Emirates
US$/USD	United States dollar
USA	United States of America
VCF	Value chain financing
WTO	World Trade Organization

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EXECUTIVE SUMMARY

An urbanizing region where agricultural markets and agribusiness are gaining importance

Small—in some cases extremely small—farms produce much of the food consumed in the Organization of Islamic Cooperation (OIC) member countries, where the livelihood of roughly 37 percent of the population centers on agriculture[1]. About 80 percent of farms are smaller than two hectares[2]. These farms produce food for home consumption in addition to a small surplus of food and cash crops. Farmers tend to market this surplus through traditional channels, although across the member countries, as in the rest of the world, agri-food value chains are modernizing to meet increased urban demand, associated changes in consumption patterns, and more stringent food quality and safety requirements. The implications for the region's large number of relatively poor farmers are explored here through case studies from eight OIC member countries: Mozambique, Nigeria, Uganda, Bangladesh, Indonesia, Turkey, Kyrgyz Republic, and Jordan. Together, these countries reflect the diverse endowments, agricultural systems, and stages of development encountered in the 57 member countries.

A process of structural transformation is unfolding across the OIC Member Countries. In almost every member country, the share of the rural population is declining as labor shifts out of agriculture to other sectors. The urban population in OIC member countries has almost doubled in the last two decades, from 349 million to 664 million[3]. Structural transformation can be part of a powerful dynamic that lifts rural families from poverty to prosperity. But to fully leverage the opportunities that change brings and to minimize the costs of the adjustments that change requires, countries must evaluate where they are on the path of structural change and then prepare for what lies ahead by creating the right enabling environment and empowering smallholder farmers to engage in these growing markets.

Linking smallholders effectively to markets: Recommendations for the OIC member countries

Creating the right enabling environment is critical for improving access to markets. In general, reforms that have encouraged the private sector's role and reduced the government's direct involvement in agricultural marketing have had positive outcomes. But the case studies also reveal that positive outcomes depend on certain conditions. If investments in public goods such as irrigation, roads, agricultural research and development, and extension are lacking, if major shortcomings are encountered in policies

[1] Authors, based on World Bank, forthcoming.
[2] FAO (2001, 2013a).
[3] World Bank (2014h).

and institutional arrangements, or if macroeconomic conditions are unfavorable, opening up greater space for the private sector does not necessarily translate into greater investment and benefits for smallholder farmers. Policies intended to prop up traditional crops or to anticipate emerging winners will likely fail, but policies that build on comparative advantage and support farmers and investors along the value chain can provide a framework that promotes adaptation and success for the sector as a whole.

Investments in transport and energy infrastructure are fundamental for improving access to markets. In addition to investing in new infrastructure and upgrading existing infrastructure, adequate attention needs to be given to consistent investments to maintain it. Improvements in logistics are also essential, as they impact the efficiency and reliability of supply chains.

Telecommunications infrastructure plays an outsized role in modernizing marketing and widening participation in value chains. Mobile phones make it possible to convey timely, accurate information on prices, buyer contacts, distribution channels, specifications for grades and standards, and storage recommendations. Such information significantly reduces the transaction costs for smallholders. Phones can also be used to reach smallholder farmers more effectively and improve their access to agricultural inputs, advice, and a growing range of financial services.

Improving access to finance will go a long way in linking smallholder farmers to markets. Innovations are needed to permit more flexible forms of agricultural lending while guaranteeing that borrowers repay. Although many innovations in agricultural financing already exist, they are not widely known; this paper reviews some promising innovations.

Governments, the private sector, donors, and non-governmental organizations are facilitating linkages for smallholders in a number of ways, and the primary lesson from these efforts is that finding ways to manage transaction costs is a prerequisite for connecting smallholders to more coordinated supply chains. For governments and donors, an important means of reducing the transaction costs of linking smallholder farmers to markets is to facilitate aggregation by helping to form ***producer organizations, associations,*** or ***cooperatives*** (or to strengthen existing ones). In addition to producer organizations, **productive alliances**, a four-step approach that organizes farmers, links them to markets, provides technical assistants and provides production investments, can be effective. **Contract farming**, which provides farmers with a guaranteed market for what they produce is another way for small-scale farmers to enter markets from which they are normally excluded. In some places, women face additional market-entry obstacles due to societal norms. When this is the case, efforts are needed to ensure **that women as well as men have equal opportunities** to benefit from transforming agri-food supply chains.

A final consideration is that insufficient or uneven investment in rural health and education places smallholder farmers at a disadvantage in adjusting to rapidly evolving agri-food markets. The technical skills and knowledge that all farmers, particularly smallholders, require to participate effectively in modern agri-food value

chains will only increase. Programs to improve farmers' knowledge of production and marketing strategies, comply with grades and quality standards, and ensure that their production practices are sustainable will likely have better outcomes if the farmers who participate have basic education, including literacy and numeracy. In the process of structural transformation, investments in education and health also enable the labor force to adapt more readily to changes and benefit from opportunities. A healthy, educated rural population is in a better position to transition to work outside of agriculture.

INTRODUCTION

This study, "Facilitating Smallholder Farmers' Market Access in OIC Member Countries," has been prepared for the 4th Meeting of the Standing Committee for Economic and Commercial Cooperation (COMCEC) Agriculture Working Group on September 25, 2014. COMCEC aims to enhance cooperation among OIC member countries by sharing experiences and good practices as well as developing a common understanding and approximating policies among the Member States. Agriculture is one of the six cooperation areas identified in the COMCEC Strategy.

By contributing significantly to national economic growth as well as rural employment, agriculture occupies an important place in economic development, especially among the least developed and developing OIC member countries. About 54 percent of the population in OIC member countries lives in rural areas, and most of the rural population depends upon agriculture for their livelihoods. In this regard, agriculture is not just a means of producing food; it is also a very important means of broad-based income generation for many member countries[4].

Across OIC member countries, a process of structural transformation is unfolding. The urban population in member countries almost doubled in the last two decades, rising from 349 million to 664 million. As the share of the rural population declines in almost every member country, labor is moving from agriculture to other sectors. Agricultural output and incomes are on the rise, even as agriculture becomes less predominant in the economy as a whole. Only about 25 percent of OIC member countries have economies that are still based on agriculture (economies in which agriculture accounts for more than 30 percent of GDP and over 50 percent of employment). Another 34 percent are beginning the transition to a more urban and less agricultural economy. The remaining 41 percent are either urbanizing or urban[5].

The effects of structural transformation are rippling through food markets. The composition of food demand is changing rapidly as per capita incomes rise and urbanization intensifies. Across OIC member countries, as in the rest of the world, agri-food value chains are transforming and modernizing to meet this increased urban demand. The pace and extent to which agri-food value chains are transforming varies according to where countries are in the process of structural transformation, commodity characteristics, and the types of markets that are being supplied. What do these trends mean for the region's relatively large number of smallholder farmers? That question is significant for OIC member countries, as rural areas have a higher incidence of poverty, and a disproportionate share of poor people derive their incomes from agriculture. More efficient and inclusive agricultural value chains are important not only for smallholder farmers but for the urban poor, who stand to benefit from lower food prices.

[4] World Bank (2014h).
[5] Authors, based on World Bank, forthcoming.

Using case studies from eight OIC members countries, this paper summarizes current knowledge related to smallholders' participation in crop-related markets, the constraints to their participation, and strategies to improve their access to markets. Based on data analysis and literature reviews, the case studies vary in their treatment of the issues but highlight the many challenges involved in linking smallholder farmers to markets.

Objectives of the Study

The objectives of this study are to: i) identify and assess agricultural markets with a special focus on smallholder farmers, and elaborate on the significance of smallholder farmers in agricultural markets; ii) determine recent trends and regulations related to facilitating smallholder farmers' access to the agricultural markets in the world; iii) elaborate on the current situation of agricultural markets in terms of the scale of agricultural holdings and the recent trends for easing the market access of smallholder farmers in the OIC member countries; iv) Evaluate the challenges faced by smallholder farmers in terms of their access to agricultural markets in the OIC member countries; v) make recommendations for creating a well-functioning agricultural marketing system and facilitating market access of smallholder farmers in the OIC member countries.

Results of the Study

The case studies indicate that creating the right enabling environment is critical for improving access to markets for all farmers, including smallholders. In general, reforms that have encouraged the private sector's role and reduced the government's direct involvement in agricultural marketing have had positive outcomes. But the case studies also reveal that positive outcomes depend on certain conditions. If investments in public goods such as irrigation, roads, agricultural research and development (R&D), and extension are lacking, if major shortcomings are encountered in relevant policies and institutional arrangements, or if macroeconomic conditions are unfavorable, efforts to open up greater space for the private sector do not necessarily translate into greater investment and benefits for smallholder farmers. Policies intended to prop up traditional crops or to anticipate emerging winners will likely fail, but policies that support farmers and investors along the value chain can provide a framework that promotes adaptation and success for the sector as a whole. Exchange rate, trade, and price policies all substantially affect the extent to which smallholder farmers participate in and benefit from agricultural markets. While some OIC member countries such as Mozambique have gone from taxing to supporting farmers on average, others such as Côte d'Ivoire still tax farmers heavily.

In addition to macroeconomic and trade policies, the quality of other policies and regulations that impinge on agriculture will influence markets' effectiveness, their efficiency, and smallholders' participation. They include policies and regulations related to agricultural inputs (seed, fertilizer, irrigation, and drainage), land, natural resources, domestic marketing, agricultural R&D, extension, food safety, biosafety, grades and

standards, plant protection, and animal health measures. Beyond these considerations, a country's contract law, competition policy, investment policies, regulations (of the environment, labor, health, and safety), and procedures for starting a business, getting utility connections, registering property, and obtaining finance are also important.

Transport and energy infrastructure are fundamental for improving access to markets. In 2004, only 53 percent of the rural population in OIC member countries had access to an all-season road.[6] Investments to improve road infrastructure and extend and upgrade rural feeder roads in main production zones tend to have high payoffs. Investments in ports and railway systems are also critical in many countries. Sporadic investments to build and upgrade infrastructure will not be sufficient; consistent investment is needed to maintain that infrastructure adequately. Improvements in logistics are also fundamental, as logistics impact the efficiency and reliability of supply chains. Access to electricity—as well as its cost and the dependability of supply—influence the market opportunities available to smallholders, their production costs, and marketing costs. In about 45 percent of OIC member countries, less than half of the rural population has access to electricity[7]. Investments in rural electrification are important to spur private investment in modern agri-food chains.

Telecommunications infrastructure plays an outsized role in modernizing marketing and widening participation in value chains. Mobile phones can convey timely, accurate information on prices, buyer contacts, distribution channels, specifications for grades and standards, and storage recommendations. Such information significantly reduces the transaction costs for smallholders. One of the case studies highlights how mobile phones have reduced the number of intermediaries in staple food value chains, enabling farmers to sell directly to wholesalers. Phones can effectively deliver advice, access to agricultural inputs, and a growing range of financial services to large numbers of smallholder farmers.

Finance also brings smallholder farmers into markets and increases their incomes by enabling them to invest in new technologies, purchase better inputs, and ultimately improve productivity. Financial services are developing rapidly, yet a majority of smallholders still cannot take advantage of them. New strategies are needed to permit more flexible forms of agricultural lending while guaranteeing that borrowers repay. Although many innovations in agricultural financing exist, they are not widely known; some promising developments are presented here.

Innovative institutional and organizational arrangements must be promoted to ensure that modern agri-food supply changes are inclusive. A concerted effort by the public sector, private sector, donors, and non-governmental organizations (NGOs) is needed to build and reinforce smallholders' links to markets. Government and the private sector are facilitating linkages for smallholders in a number of ways, and the primary lesson from these efforts is that aggregation is a prerequisite for connecting smallholders to more coordinated supply chains. An important means for government and donors to support

[6] An "all-season road" can be transited year-round by the prevailing means of rural transport (typically a pick-up or a truck that does not have four-wheel-drive).
[7] World Bank (2012f, 2013f).

aggregation is to support the formation of producer organizations and build their capacity to operate effectively. Neither donors nor governments are well suited to provide the business development and management training that producer organizations need to operate more effectively; those skills are delivered better by private service providers or NGOs with the appropriate capacity. What government and donors can provide, however, is indirect support—for example, through instruments such as demand-driven funds to support producer organizations' developmental needs

Aside from producer organizations, other institutional arrangements are evolving to better link smallholder farmers to markets. One promising approach is productive alliances, which have four building blocks: organizing farmers, linking them to markets, investing in production and marketing, and providing technical assistance. In productive alliances, the main instrument for forging the links between producers or producer organizations and agribusiness has been competitively allocated matching grants. Contract farming is another avenue for enabling smallholder farmers to enter markets from which they are normally excluded, owing to distance, standards, processing requirements, or other factors. Smallholders who have access to assets and capital and who regularly produce marketable surpluses are in the best position to benefit from contract farming. Contract farming may not be suitable for asset-poor smallholder farmers or even the majority of smallholders, who are largely subsistence farmers (unless they are part of an effective producer organization, with requisite management and financial capabilities).

A final consideration is that insufficient or uneven investment in rural health and education places smallholder farmers at a disadvantage in adjusting to rapidly evolving agri-food markets. The technical skills and knowledge that all farmers, particularly smallholders, require to participate effectively in modern agri-food value chains will only increase. Programs to improve farmers' knowledge of production and marketing strategies, comply with grades and quality standards, and ensure that their production practices are sustainable will likely have better outcomes if the farmers who participate have basic education, including literacy and numeracy. A healthy, educated rural population is in a better position to benefit from the changes and opportunities that accompany structural transformation and make the transition to work outside of agriculture.

In summary, no "silver bullet" exists to link smallholder farmers to markets. Successful policies and interventions to improve smallholders' links to markets will be shaped by a particular country's current position in the process of structural transformation, its endowments, both natural and man-made, and by where the country is heading. Nevertheless, OIC member countries have much to gain from sharing first-hand experiences with strategies that successfully linked smallholders to markets, as well as strategies that failed. Two particularly important areas for technical cooperation are to better understand how to foster effective producer organizations and how to establish effective platforms for consultation and collaboration across the public sector, agribusiness, producer groups, and innovation-driven agencies. Evidence indicates that it is often easier to form producer organizations than it is to make them financially viable and sustainable. Issues that warrant attention include the identification of appropriate

internal governance arrangements and strategies to strengthen the links between producer organizations and national agricultural and research systems and between producer organizations and actors downstream in the value chain. Identifying mechanisms for resolving disputes effectively and building producer organizations' capacity to use those mechanisms will also have strong payoffs. Platforms for consultation and collaboration can provide many benefits as they link the public and private sectors, farmer organizations, and other stakeholders to facilitate knowledge sharing and address policy and other shared issues related to a particular commodity.

CHAPTER 1: SMALLHOLDER FARMERS AND AGRICULTURAL MARKETS IN THE OIC MEMBER COUNTRIES: A CONCEPTUAL FRAMEWORK

The Definition of Smallholder Farmers and Farm Size Structure in the OIC Member Countries

The definition of a smallholder farmer varies considerably depending on the country and context. Most definitions focus on one or more of the following variables: physical farm size, the extent to which family labor is used in farming, income from farming, and the extent of market participation. Sometimes smallholder farmers are defined as farmers who have limited resource endowments relative to other farmers in the sector and who have diverse livelihood sources, with non-farm income being an important one.[8] A smallholder farm is sometimes defined as a family-owned enterprise that produces crops or livestock on two hectares or less, mainly using family labor, and provides the family's primary income.[9] Sometimes it is described as up to two hectares of cropped land operated by a farmer with a low asset base.[10] Taking a slightly different approach, the EU defines smallholder farmers based on a set of criteria that includes the physical size of the farm, labor input in farming, market integration, and the economic size of farm.[11] For this study, smallholder farmers are defined as *farmers operating two hectares of agricultural land or less*.

The sheer number of small farms often represents a significant challenge in linking farmers to markets. Table 1 shows numbers of farms categorized by size for selected OIC member countries.[12] Many countries have more than a million farms, most of which occupy less than two hectares. As Asia's Green Revolution showed, small farms can be productive and can be a source of profound growth, but the markets and transportation networks needed to connect them to urban consumers are costly and difficult to build. While many surveys providing data for the table are outdated, the case studies discussed in the next chapter find little evidence that farm size is expanding in most African and Asian countries. Even where there is evidence of consolidation, the pace of consolidation is slow. The inescapable conclusion is that in this generation and the next, for economic growth and structural change to bring prosperity to most farmers, the problem of connecting small farms to urban consumers must be solved.

[8] Dixon, Tanyeri-Abur, and Wattenbach (2004).
[9] IFC (2013b).
[10] World Bank (2003).
[11] EU (2011).
[12] Data are included for a subset of countries, as comparable data are not available for all OIC member countries.

TABLE 1: FARM SIZE DISTRIBUTION IN SELECTED COUNTRIES AND VARIOUS YEARS

Country (year)	< 1 ha	1–2 ha	2–5 ha	5–10 ha	10–20 ha	> 20 ha
Albania (1998)	466,809	279,793	140,377	46,639	–	–
Algeria (2001)	1,023,799	223,115	128,864	239,844	181,267	107,729
Djibouti (1995)	1,135	944	191	–	–	–
Egypt (1999–2000)	3,955,941	365,362	170,625	35,996	10,953	3,007
Guinea (1995)	442,168	150,950	137,247	123,732	30,239	–
Guinea Bissau (1998)	84,221	59,120	14,809	8,531	1,590	–
Indonesia (2003)	18,606,642	3,460,406	2,801,627	–	–	–
Iran (2003)	4,332,423	2,056,727	522,956	797,006	491,156	169,399
Jordan (1997)	47,509	28,728	6,532	3,291	1,778	614
Lebanon (1998)	194,829	141,594	27,434	19,536	3,127	1,155
Libya (1987)	175,528	25,213	17,654	43,904	40,406	17,066
Mali (2004–05)	805,194	255,596	108,998	189,636	142,932	28,967
Morocco (1996)	1,496,349	380,039	272412	411,967	247,766	58,996
Mozambique (1999)	3,037,782	1,633,986	922,603	426,665	49,941	648
Pakistan (2000)	6,620,054	2,389,423	1,425,370	1,857,166	580,200	107,104
Senegal (1998)	437,037	91,532	72,226	142,213	90,669	6,071
Turkey (2001)	522,990	539,816	950,840	560,049	327,363	175,592
Uganda (1991)	839,369	411,810	296,560	97,013	59,969	–
Yemen (2002)	1,180,105	865,733	124,052	107,170	83,150	–

Source: Lowder, Skoet, and Singh 2014.

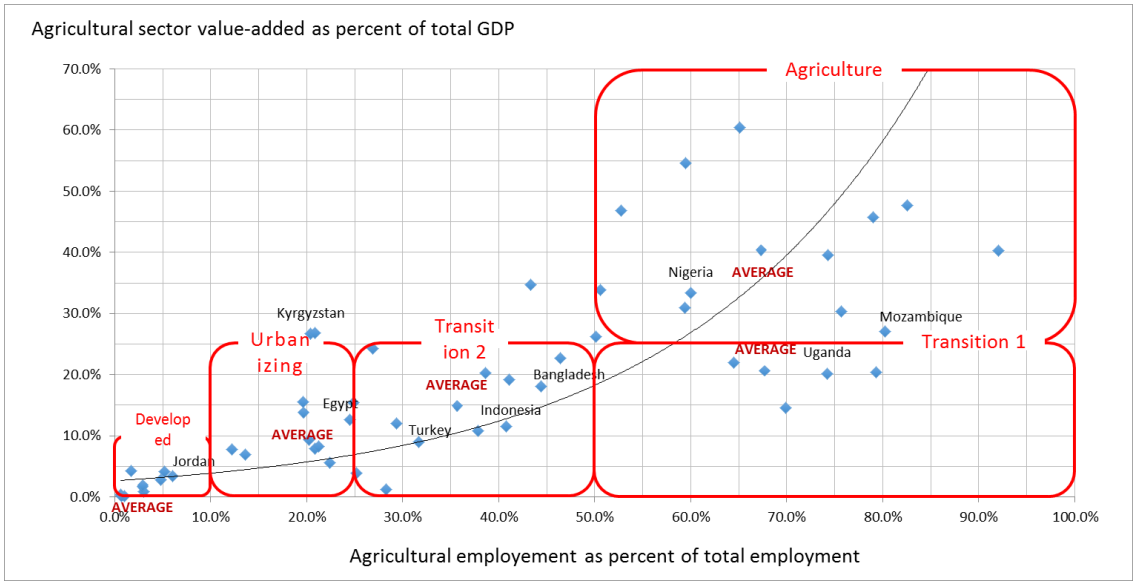
A Framework for Examining Smallholder Farmers' Participation in Agri-Food Markets in OIC Member Countries

To reflect the diverse endowments, agricultural systems, and stages of development among the 57 OIC member countries, the analysis in this study classifies countries into one of five stages in the structural transformation process, based on a framework developed to examine the evolving role of agribusiness in the agricultural sector.[13] That framework expands on the classification of countries used in the *World Development Report 2008: Agriculture for Development*, which divided countries into three groups—agriculture-based, transforming, or urbanized—based on the share of aggregate growth originating in agriculture and the share of aggregate poverty (US$ 2.15 a day) in the rural sector.[14]

In the five-stage classification used here, countries in the first stage are considered *agriculture-based economies.* In those economies, agriculture accounts for over 30 percent of GDP and over 50 percent of employment. Based on the data available from 51 of the 57 OIC member countries, roughly 25 percent of member countries fall into this group (Figure 1). With the exception of Afghanistan, all of the agriculture-based countries are in Sub-Saharan Africa (SSA).

[13] "Benchmarking the Business of Agriculture" (World Bank, forthcoming).
[14] World Bank (2007).

FIGURE 1: OIC MEMBER COUNTRIES BY AGRICULTURAL CLASSIFICATION



Source: Authors, based on World Bank, forthcoming.

In the next stage, *transition 1*, the relative importance of agricultural GDP declines as the other economic sectors start to expand. In *transition 1* countries, agriculture accounts for less than 25 percent of value added but provides more than 50 percent of employment. About 10 percent of OIC members would be classified as *transition 1;* once again, they are all in SSA. In *transition 2* countries, less than 50 percent of employment is directly in primary agriculture. About 24 percent of OIC member countries are classified as *transition 2* countries; they include a couple of large countries in East and South Asia (Indonesia, Bangladesh, and Pakistan), several countries in Europe and Central Asia (ECA) (Turkey, Tajikistan, Turkmenistan, and Albania), and a few in the Middle East and North Africa (MENA) and SSA (Yemen, Oman, Côte d'Ivoire, and Gabon). The number of people in poverty (that is, below the US$ 2 per day international poverty line) falls as countries move out of the *transition 1* stage.

The next group of countries is classified as *urbanizing*. Agricultural employment in these countries is below 25 percent, and agricultural GDP is relatively less important in the overall economy than it is among the transforming and agriculture-based countries. This group comprises 19 percent of OIC members, primarily countries in ECA and in MENA (Egypt, Iran, and Morocco, for example). The group also includes one East Asian country (Malaysia).

Finally, in *urban* economies, the primary agricultural sector generates less than 10 percent of employment and GDP. Countries classified as *urban* are located in MENA and include OIC members such as Saudi Arabia and Jordan. In both *urbanizing* and *developed* economies, the reduction in direct farm employment is partially offset by the increasing number of jobs created in the overall food supply chain.

To examine the role of smallholder farmers in agricultural markets in OIC member countries, this study draws on case studies from eight member countries representing the five stages of structural transformation: Nigeria and Mozambique (*agriculture-based*); Uganda, Indonesia, Bangladesh, and Turkey (*transition 1* and *2*); and Jordan and Kyrgyz Republic (*urbanizing* and *urban*). About 44 percent of the population in OIC member countries resides in these eight countries.

In terms of international trade, "market access" typically refers to the conditions set by countries (such as tariffs and other trade policy instruments) for specific goods to enter their markets. In this study, however, "market access" refers to the many dimensions through which farmers connect or link to markets—the various institutional arrangements, marketing systems and channels, physical and financial infrastructure, and policies that directly or indirectly influence how smallholder farmers gain access to buyers and consumers of their marketable surplus.

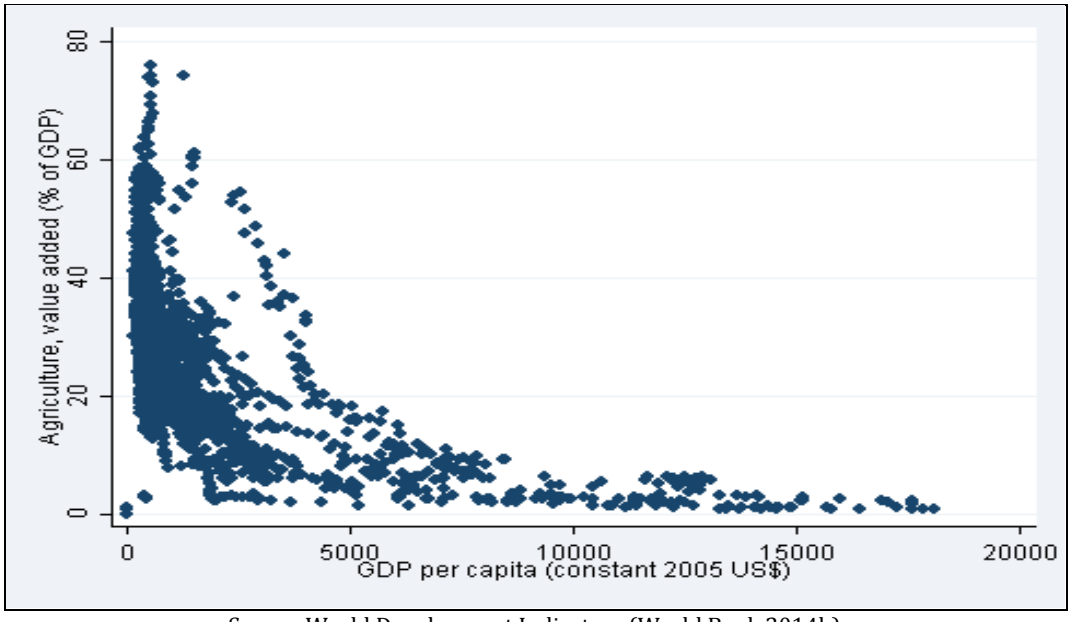
Structural Transformation and Economic Growth: Implications for Connecting Smallholder Farmers to Markets

Ideally, structural transformation entails a shift of labor from agriculture to other sectors where incomes are higher on average. Agricultural output continues to grow through productivity gains, powered by the adoption of new technologies and increases in human and physical capital. As the share of food consumers relative to food producers grows, markets become more important, and the agribusiness sector grows in response. When all goes well, the reallocation of resources within the economy and the adoption of new technologies in agriculture combine to support widespread growth throughout an economy. The rural poor who engage in farming benefit from gains in agricultural productivity, and their rural communities benefit from spillover gains. The urban population, especially the urban poor, benefits from lower food prices. This virtuous form of structural transformation and rural change has been repeated in many places, but it is far from a guaranteed outcome.

Each country takes a unique path of development, yet there are some powerful patterns of development that link agricultural growth and economic growth. In one such pattern, the agricultural sector comes to comprise a smaller share of the economy. This pattern is seen in OIC member countries as a whole. Figure 2 maps agriculture's share of GDP against average per capita income, adjusted for inflation. The data points include every available observation for each OIC member country from 1961 to 2012 for income levels less than US$ 20,000 per capita. In general, agriculture makes up a larger portion of the economy when countries are poor, but its share tends to drop quickly as countries develop.

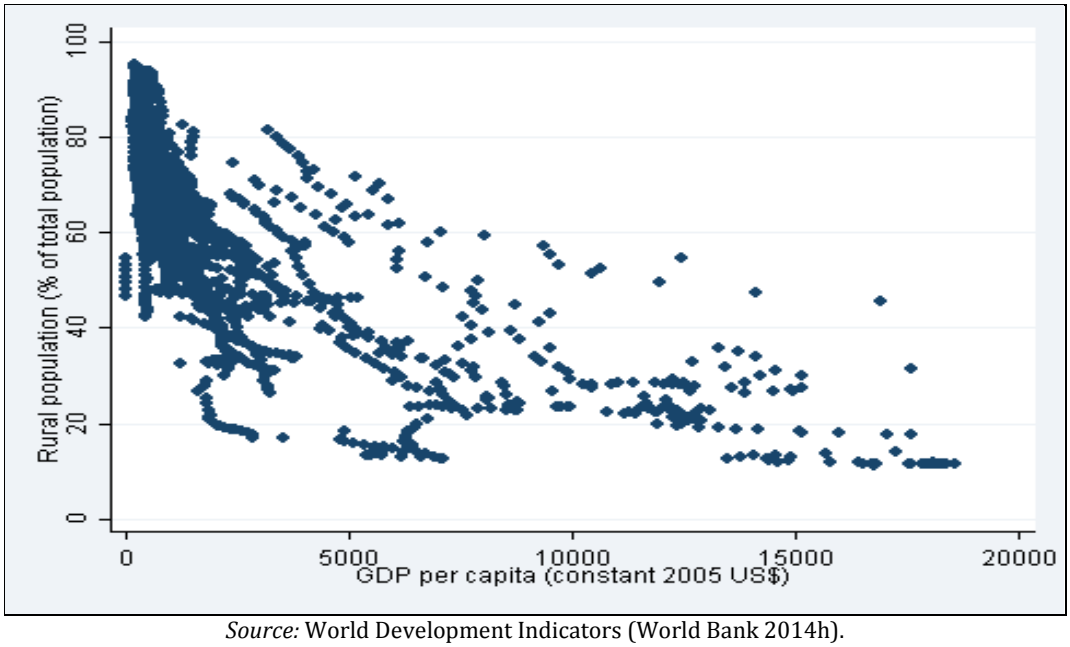
The shift occurs largely because incomes outside of agriculture are generally higher than in agriculture for low-income countries. As the skill level of people working in agriculture rises and opportunities in other sectors become available, some people leave the sector. Increasingly, the jobs and the people move to urban areas. Although there is less conformity to this pattern of development across countries at different income levels, the general downward pattern is clear (Figure 3).

FIGURE 2: AS AVERAGE INCOMES GROW, AGRICULTURE'S SHARE OF GDP DECLINES



Source: World Development Indicators (World Bank 2014h).

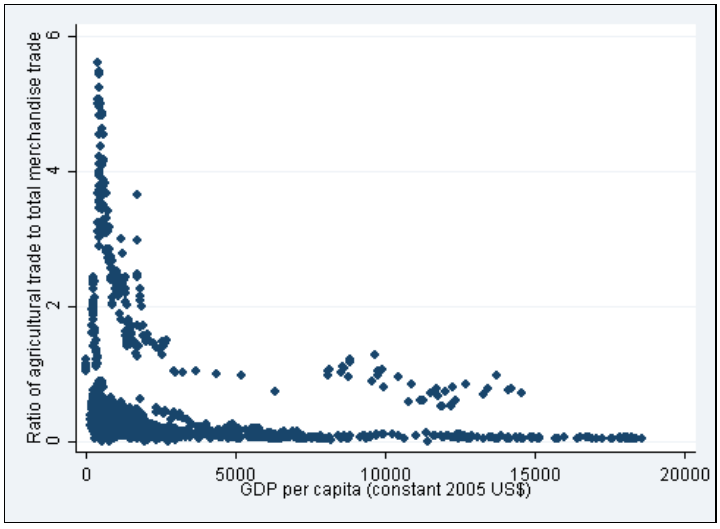
FIGURE 3: COUNTRIES BECOME MORE URBAN AS POPULATIONS GROW



Source: World Development Indicators (World Bank 2014h).

Consistent with the changing structure of economic production, agricultural trade—incomes and exports—becomes less important compared to other types of trade (Figure 4). Some of the case studies demonstrate that agriculture is often a sticking point when trade agreements are negotiated, but trade in agricultural products is rarely a significant share of total trade once countries reach middle-income status.

FIGURE 4: AGRICULTURAL TRADE AS A SHARE OF TOTAL MERCHANDISE TRADE DECLINES WITH ECONOMIC GROWTH

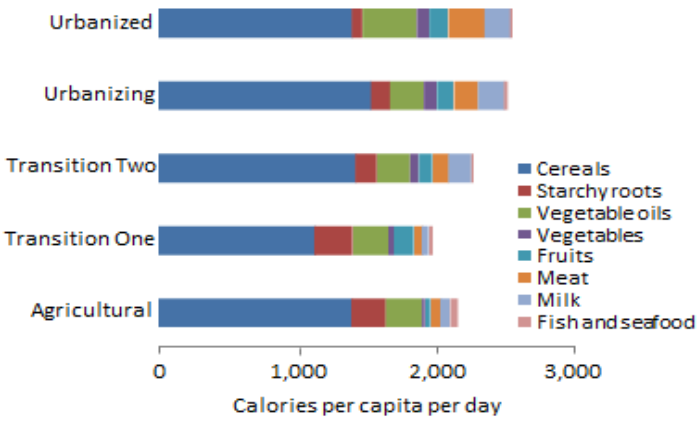


Source: FAOSTAT (FAO 2014).

As incomes grow and populations become more urban, the composition of diets tends to change. To a degree, people living in wealthier countries consume more calories in total, but the average differences are not large (Figure 5). Instead, their diets start to feature more meat and horticultural products, fewer cereals, and fewer starchy roots and tubers like potatoes and cassava.

A larger difference, which is harder to show in a graph, is that markets and agribusinesses become more important with urbanization. Farmers in poorer countries often consume a significant share of what they produce, but some of the case studies demonstrate that when urbanization gains momentum, more people start to purchase food in supermarkets and fast-food restaurants. Throughout this transition, government has an increasingly essential role in ensuring that both the infrastructure and regulatory framework are in place to keep food safe, enabling all farmers to participate in agricultural value chains, and ensuring

FIGURE 5: COMPOSITION OF DIET BY TYPE OF ECONOMY, 2009

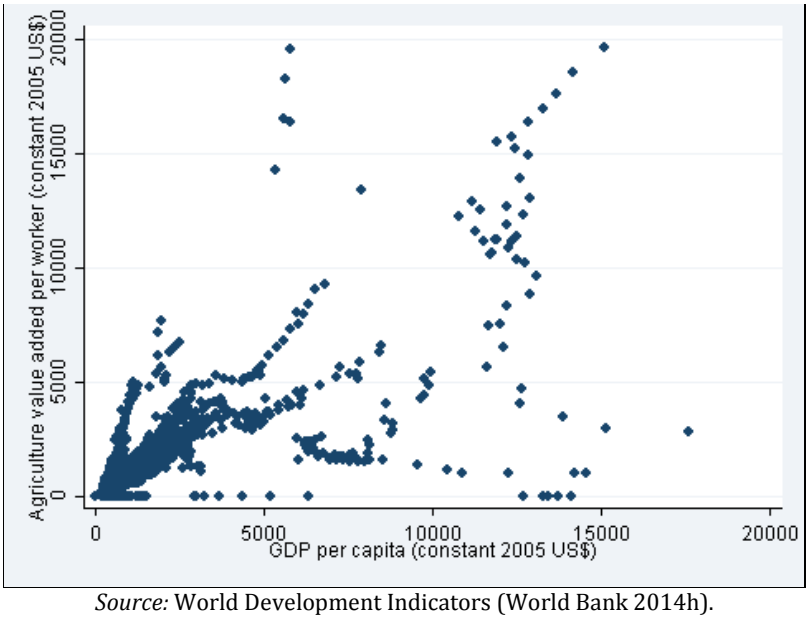


Source: FAOSTAT (FAO 2014).

that value chains are efficient.

In general, agricultural incomes rise as economies grow. In countries with comparative advantages in agriculture, including some of the case study countries, incomes in agriculture can exceed average incomes. As noted in the Introduction, this pattern of development is important, because often in developing countries a disproportionate share of poor people obtain their incomes from agriculture (Figure 6).

FIGURE 6: VALUE ADDED PER AGRICULTURAL WORKER AND GDP PER CAPITA



Source: World Development Indicators (World Bank 2014h).

The pattern in which economic growth is linked with growth in agricultural incomes is more tenuous than the patterns discussed earlier, however. One reason is that comparative advantages and incomes in agriculture can be quite high in countries that produce and export high-value crops, but at the same time, a lack of investment or uneven investment in rural health, education, telecommunications, and transport can cause some communities and households to be marginalized.

Dramatic Change in Agricultural Markets and Marketing Systems

Over the last five decades, agricultural markets and marketing systems have changed rapidly and dramatically. In the aftermath of droughts, famines, and oil price shocks in the mid-1970s and early 1980s, many governments in Asia, Africa, and Latin America placed priority on policy instruments designed to stabilize commodity markets, "get prices right," and buffer the poor from food supply shocks.[15] To achieve those objectives, many

[15] Rashid, Gulati, and Cummings, Jr. (2008); Reardon and Timmer (2007).

countries elected to establish parastatal agencies and marketing boards. The agencies varied in size and scope, but some were involved in all aspects of agricultural marketing. They supplied inputs and credit, processed raw materials, found buyers for output, and managed exports, imports, and domestic commodity pricing.[16] Government intervention in markets through marketing agencies was seen as a way to "get around" inefficient and traditional marketing systems.[17] Many developing countries also instituted price and quantity restrictions, often to ensure that affordable food was available to support the early stages of industrialization. Some governments administered prices directly by setting fixed prices or limiting domestic price fluctuations through ceiling and/or floor prices. Others influenced prices indirectly through output and input price subsidies. Still others restricted the volume of imports and exports, or they maintained quotas on domestic supply. [18]

Starting in the early to mid-1980s, accompanying structural adjustment programs, commodity and input markets gradually began to be liberalized—first in Latin America and Asia, then in Africa, later in the socialist countries of Central and Eastern Europe, and finally in East Asia.[19] Marketing parastatals were viewed increasingly as highly inefficient, wasteful, and fiscally unsustainable, and there was a move to restructure or dismantle them and reduce government's direct involvement in output marketing.[20] These institutional reforms occurred alongside efforts to liberalize input and output prices, remove quantitative restrictions, and encourage greater private sector participation in marketing. Studies indicate that the demise of parastatals for coffee, cocoa, and other export crops tended to benefit farmers by increasing the share of export revenue they received.[21] The specific impacts on farmers and consumers varied, however, depending on the completeness of reforms and underlying institutional factors, including the appropriateness of regulatory frameworks.

As many countries embarked on reforms to remove or eliminate distortions in domestic markets, international markets were also deregulated via the Global Agreement on Tariffs and Trade and later the World Trade Organization (WTO).[22] Trade liberalization reduced tariffs, export taxes, consumer subsidies, and producer price controls and provided further impetus for restructuring or dismantling parastatals. Lower trade barriers, along with improvements in transport and technological advances in storage, processing, and shipping, greatly increased the efficiency and distance of trade and domestic marketing.[23]

In the early to mid-1990s, the broader liberalization of capital markets was accompanied by deregulation of foreign direct investment (FDI) in many developing countries.[24] As FDI flows increased and shifted toward the service sector (including retail, infrastructure, and

[16] Lundberg (2005).
[17] Reardon and Timmer (2007).
[18] Lundberg (2005).
[19] Reardon and Timmer (2007).
[20] Lundberg (2005).
[21] Akiyama et al. (2003).
[22] Reardon and Timmer (2007).
[23] Reardon and Timmer (2007).
[24] Reardon and Timmer (2007).

financial services), the downstream segments of the food system (including the retailers, processors, and wholesalers in developing countries) started to attract a larger flow of FDI. Supermarket chains based in Europe, North America, and other developed countries, facing market saturation and intense competition in home markets, began investing in developing countries, attracted by the much higher margins to be made.[25]

The expansion of supermarkets in developing countries in the last 10–15 years brought sweeping changes to agri-food markets. Prior to the spread of supermarkets, most transactions took place in spot markets such as traditional wholesale markets. Spot markets are not conducive to coordinating the quantity, quality, and timing of supply and demand, which is an important requirement of the modern retail sector. The advent of supermarkets encouraged a shift from relying on spot markets to working with specialized/dedicated wholesalers, who cut transaction and search costs and also enforce private standards and contracts on behalf of the supermarkets. Supermarkets and their wholesalers also rely more frequently on contracting and vertical coordination to source produce.[26] Under such arrangements, producers enter into forward agreements, sometimes at a predetermined price, for the production and supply of agricultural commodities in return for production support (technical advice, inputs, and/or finance) from the purchaser (wholesalers, processors, retailers, or exporters). In this way, purchasers can better coordinate supply and demand.

Another distinguishing feature of modern agri-food systems is their emphasis on compliance with grades and standards, which affects farmers in developing countries through multiple channels. For example, farmers producing fresh and processed products for export must increasingly meet quality and safety standards, especially if they are supplying markets in European, North American, and other developed countries that strictly enforce such standards. Supermarkets and other buyers are also more likely to expect their farmer-suppliers to meet a widening array of private standards. As the modern food retail sector expands, compliance with grades and standards is also enforced more thoroughly in domestic markets (although to varying degrees).

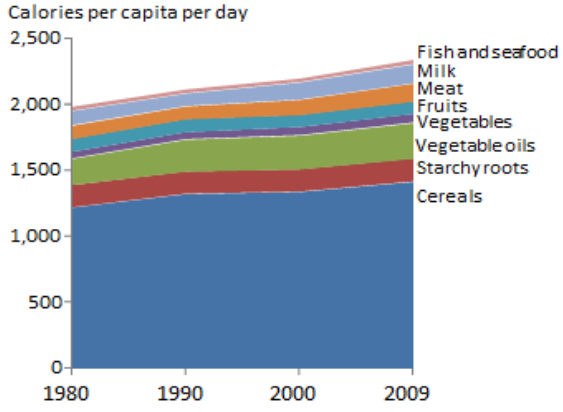
The present and future environmental impacts of agri-food systems are also receiving much more attention. Many certification programs now incorporate environmental standards in addition to normative, social, and labor standards. For example, growing numbers of farmers supplying a range of beverage crops (such as coffee and cocoa), as well as commodities such as oil palm, must comply with environmental standards focused on preserving forests, natural habitats, and biodiversity. As agri-food systems are more widely recognized to be major users of natural resources, their impact on climate change and their carbon footprint are facing closer scrutiny.[27]

[25] Reardon and Timmer (2007).
[26] Reardon and Timmer (2007).
[27] The agri-food sector as a whole is estimated to contribute to some 23 percent of global resource use, 18 percent of greenhouse gas emissions, and 31 percent of acidifying emissions (Blandford 2013).

Fundamental Changes in Food Demand and Global Food Trade

As discussed, consumers in OIC member countries are demanding more vegetable oils, animal products (meat and dairy foods), and sugar and less of their traditional staples (cereals, roots, and tubers); with rising incomes, they are also demanding more processed food. Per capita consumption of cereals in OIC member countries rose by 16 percent between 1980 and 2009, whereas daily per capita consumption of other foods rose much more rapidly (vegetables rose by 35 percent; vegetable oils, by 36 percent; and meat, by 37 percent) (Figure 7). An even more dramatic change is occurring in consumers' spending on different types of food products. In many countries, middle-class consumers now spend more on protein-based foods than on cereal-based foods. In some countries, even the poor are spending more on meat and less on cereals, due to cost differentials and their own subsistence production. These changes in the composition of food demand and changes in the relative value of food expenditures are reshaping both the upstream and downstream segments of the food industry.[28]

FIGURE 7: AVERAGE FOOD SUPPLY IN OIC MEMBER COUNTRIES, 1980–2009 (KCAL/CAPITA/DAY)



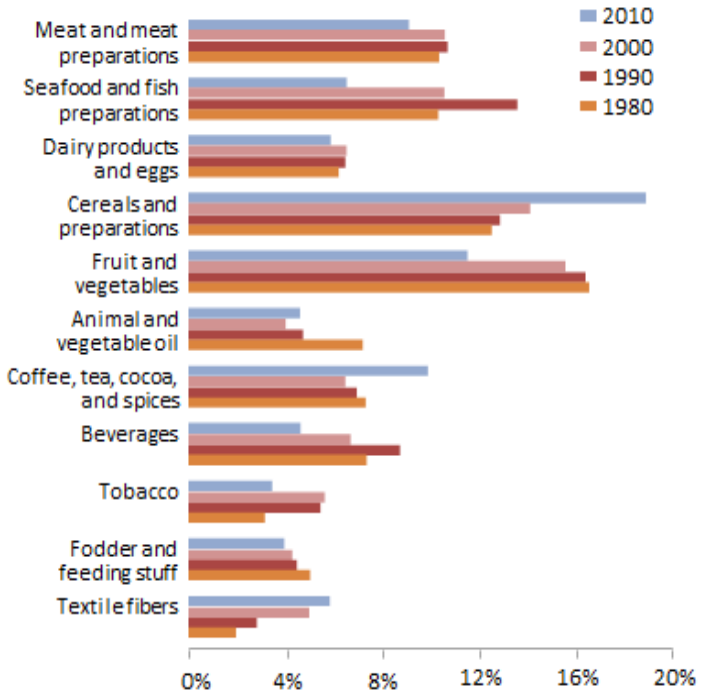
Source: FAOSTAT (FAO 2014).

The composition of global food trade has also changed. Between 1980 and 2010, the share of cereals and cereal preparations in world agricultural exports declined from 19 percent to 13 percent, as did the shares of coffee, tea, cocoa, and spices (10 percent to 7 percent) and textile fibers (6 percent to 2 percent). On the other hand, shares of animal and vegetable oils, fruit and vegetables, and animal fodder and feed in global agricultural trade grew steadily (Figure 8). The changing composition of global agri-food trade also influences domestic markets in developing countries by presenting producers with new opportunities and requirements.

[28] The "upstream segment" refers to input suppliers and farmers; the "downstream segment" refers to processors and retailers.

Table 2 summarizes the composition of food and agricultural trade for OIC member countries. The largest category of exports comprises coffee, tea, cocoa, and spices, followed by fruit and nuts and then by fish, crustaceans, and molluscs (see Annex Table 1.11 and Table 1.12). The main imports for OIC member countries are wheat, followed by sugar, dairy and eggs, and rice (see Annex Table 1.13 and Table 1.14) . In *agriculture-based* and *transition 1* OIC member countries, coffee, tea, cocoa, and spices account for about 40 percent of total agri-food exports, followed in importance by exports of fish, crustaceans, and molluscs. Export trends in *transition 2* countries are similar, although coffee, tea, cocoa, and spices account for about 32 percent of export value. In *urbanizing* countries, fruit and vegetables are the major exports (36 percent of export value), followed by exports of fish, crustaceans, and molluscs. For the *urban* group, the largest export category is dairy and eggs, followed by fruit and vegetables.

FIGURE 8: CHANGE IN SHARES OF AGRICULTURAL EXPORTS (%), 1980–2010



Source: FAOSTAT (FAO 2014).

TABLE 2: COMPOSITION OF FOOD AND AGRICULTURAL TRADE FOR OIC MEMBER COUNTRIES

Imports	Share of total import value	Exports	Share of total export value
Wheat and meslin, unmilled	13.9%	Coffee, tea, cocoa, spices	22.6%
Sugar	10.0%	Fruit and nuts, excluding oil nuts	17.4%
Dairy, eggs	9.6%	Fish, crustaceans, molluscs	13.8%
Rice	11.3%	Vegetables	8.7%
Meat, meat preparations	8.1%	Miscellaneous edible products	8.0%
Coffee, tea, cocoa, spices	7.9%	Dairy, eggs	7.3%
Feed	7.4%	Sugar	5.9%
Miscellaneous edible products	7.4%	Rice	5.6%
Maize	6.2%	Feed	3.0%
Fruit and nuts, excluding oil nuts	5.6%	Live animals	2.6%
Vegetables	4.7%	Wheat and meslin, unmilled	2.4%
Fish, crustaceans, molluscs	4.6%	Meat, meat preparations	2.1%
Live animals	2.8%	Maize	0.3%
Barley	2.8%	Barley	0.2%
Total value (US$ billions)	114.8	Total value (US$ billions)	57.4

Source: UN COMTRADE Database (UN 2014).
Note: Figures based on average export values between 2008 and 2012 using SITC Rev 3.

While export markets present significant opportunities for smallholder farmers in OIC member countries, particularly the more commercially oriented farmers, increases in demand in domestic markets generally dwarf the opportunities presented by export markets. Table 3 compares estimates of domestic gross production values for the top 10 sources (Annex Table 1.28) with export values for the top 10 sources for seven of the eight case study countries. Indonesia and Jordan stand out from the other countries because the export values of their top 10 commodities are close to 70 percent of the value of gross domestic production from their top 10 sources. The comparable shares for the other case study countries are less than 15 percent.

TABLE 3: VALUE OF DOMESTIC AGRICULTURAL PRODUCTION VERSUS AGRICULTURAL EXPORTS IN CASE STUDY COUNTRIES

Case study country	Domestic gross production value, top 10 sources (average of 2010–12, in constant 2004–06 US$ millions)	Export value, top 10 products (average of 2009–11, in constant 2005 US$ millions)
Mozambique	2,920	378
Nigeria	29,304	1,026
Bangladesh	8,183	279
Indonesia	34,964	24,554
Turkey	31,932	4,752
Kyrgyz Republic	994	117
Jordan	820	564

Source: Authors' calculations, based on FAOSTAT (FAO 2014) and World Development Indicators (World Bank 2014h).
Note: No data available for Uganda.

Determinants of Smallholder Farmers' Participation in Agri-Food Markets

Numerous factors influence the extent to which smallholders participate in and benefit from agri-food markets. The enabling environment—including the prevailing macroeconomic, trade, and price policies—is a major influence. Another is the quality of policies and regulations related to the functioning of the agricultural sector, and those that more broadly affect private sector participation and investment.

Physical access to markets depends on factors such as the distance to markets, the quality of roads, and the modes of transportation available to move products to market. When markets are far away, it is generally more convenient for smallholders to sell their crops at the farm gate, but although selling at the farm gate is more convenient and reduces transport costs, it is usually less remunerative. In addition to transport infrastructure and trade logistics, access to reliable electricity, telecommunications infrastructure, and potable water also plays an important role in influencing the market opportunities available to smallholders. Smallholders' participation in markets is often limited by transaction costs, including high search and information costs as well as high costs of bargaining, negotiating, and enforcing contracts. These costs may vary by crop. High-value crops, which are often perishable, typically are associated with higher transaction costs. The availability of infrastructure, including mobile phones and roads, helps to reduce the transaction costs faced by farmers.

Public investment decisions and the effectiveness of public and private institutions in delivering services to farmers are also important factors in market participation. For example, investments in agricultural R&D, along with the effectiveness of extension and advisory services in disseminating appropriate technologies and practices, will have an impact on productivity, farmers' choice of crops and varieties, and whether smallholders have a surplus available to market. Smallholder farmers' access to markets also depends on the effectiveness of farmer organizations, access to finance, and risk management instruments.

A growing body of empirical evidence indicates that a household's private assets are also key determinants of market participation, even after controlling for public goods and policies.[29] Households with better initial endowments of assets (such as access to land and higher levels of human capital) are likely to be in a better position to take advantage of changing market opportunities. Privately held assets such as land can be an important source of collateral, influencing a producer's access to credit for purchasing inputs or investing in post-harvest infrastructure.

In OIC member countries that are still *agriculture based,* the vast majority of smallholders that have marketable surpluses are not part of structured value chains. They usually sell their surpluses to village traders or in local spot markets. Marketing is often hindered by poor access to roads and transport facilities, lack of access to financing, and limited access to updated information and technology. Typically the vast majority of smallholders have

[29] Donovan and Poole (2014).

no or only limited requirements to comply with particular grades and standards for products that they sell to local traders or spot markets, particularly for traditional staples, although requirements vary depending on the characteristics of each commodity. Even in agriculture-based economies, however, smallholders catering to higher-end markets, the agro-processing sector, or particular export markets are increasingly likely to be part of a more structured value chain in which production must be coordinated and compliance with certain grades and standards and other market specifications is required. These issues are explored further through the case studies from Mozambique, Nigeria, and Uganda in the next chapter.

In *transition* economies, with their growing urban populations, an increasing share of the population begins to buy food from markets. Because a larger amount of produce must be transported over greater distances to cater to populations in towns and cities, well-functioning infrastructure and logistics become all the more important. As incomes grow and consumers have more disposable income, they demand more high-value food products (fruit, vegetables, fish, meat, and dairy), become more aware of and concerned about certain attributes of food products, and increasingly demand better food quality and safety. Post-harvest handling and investments in marketplaces become increasingly important for the more perishable high-value products, and the need for investment in better storage and logistics facilities can grow rapidly.

The case studies from Bangladesh, Indonesia, and Turkey in the next chapter illustrate how investments in infrastructure (roads, power supply, warehouses, and cold storage) and processing can make it easier to connect large numbers of smallholder farmers to markets and help those farmers realize higher margins. The case study from Turkey also demonstrates how the rise of agribusinesses, supermarkets, and restaurants induces quality and food safety to become intrinsic aspects of the food that farmers produce. For agribusinesses, an overall environment that promotes foreign direct investment can help domestic suppliers adapt, since overseas partners can bring expertise and established marketing channels along with capital. The risk is that smaller firms and farms may lack the capital or knowledge to meet new standards. Here governments can play a vital role by aggressively reaching out to producers and intermediaries.

CHAPTER 2: CASE STUDIES ON LINKING SMALLHOLDER FARMERS TO MARKETS IN OIC MEMBER COUNTRIES

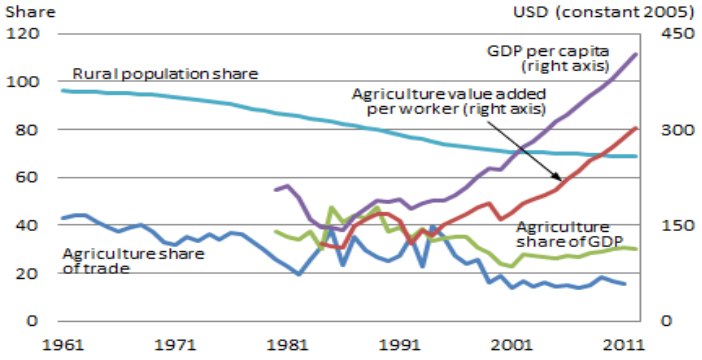
This chapter presents the case studies from eight OIC member countries. The case studies focus on the extent to which smallholder farmers participate in different crop-related markets and highlight factors that limit or enhance their participation in those markets.

Mozambique

Competitiveness and sustainability issues

Agriculture is the second-largest sector in Mozambican economy, contributing 24 percent of GDP and employing 78 percent of the workforce in 2011 (Figure 9). Growth in the agricultural sector has averaged about 7 percent annually since 2003 and has contributed significantly to overall economic growth, although agriculture's share of the economy has been declining since the 1980s[30]. Growth in agriculture has been driven mainly by the expansion in cultivated area and labor after the extended civil conflict ended and refugees resettled rural areas.[31] Agricultural incomes are growing, but so is the gap between agricultural incomes and incomes in other sectors.

FIGURE 9: STRUCTURAL CHANGE AND THE MOZAMBICAN ECONOMY, 1960–2012



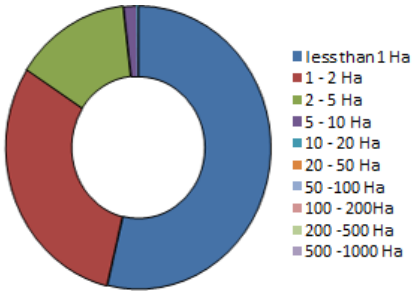
Source: World Development Indicators (World Bank 2014h).

This vast country has more than 3.8 million farming enterprises, of which 71.6 percent are smaller than 2 hectares (Figure 10). The average cultivated area per household is only about 1.4 hectares. The wide variety of regional cropping patterns reflects large regional differences in rainfall, temperature, soil types, and market access. The country's 10 agroecological zones can be broadly divided into three geographical regions: the North (Niassa, Cabo Delgado, and Nampula), Center (Zambézia, Tete, Manica, and Sofala), and South (Inhambane, Gaza, and Maputo Province). Mozambique's climate ranges from arid and semi-arid (mostly in the South and Southwest) to subhumid (mostly in the Center and North) and humid zones (in the highlands, mostly in the Center). The arid southern and southwestern parts of Gaza Province are suitable only for livestock production.[32]

[30] World Bank (2014h).
[31] World Bank (2012b).
[32] World Bank (2006b).

Rural poverty declined in Mozambique from 71 percent in 1996–97 to 57 percent in 2008/09,[33] largely because of growth in the agricultural sector, but patterns of growth are mixed. More than half of all cultivated land is still planted to low-value maize and cassava to ensure household food security, although smallholders diversify production on their remaining area with an array of other food crops. Yields are low and stagnant, however. Most crops yield only a small fraction of their potential.[34] Agricultural productivity is also affected by the high rates of malnutrition, HIV-AIDS, and malaria prevalent among rural people. Climatic extremes are another problem. Smallholders in the Zambezi Valley are particularly vulnerable to frequent alternating droughts and floods.

FIGURE 10: MOZAMBIQUE (1999–2000) COMPOSITION OF NON-ESTATE FARMS BY SIZE



Source: Lowder, Skoet, and Singh 2014.

Demand and market size

Food crop production is Mozambique's most important agricultural subsector. The two most important food crops after cassava and maize are sorghum and rice (Table 4). Owing to cassava's drought tolerance and disease resistance, the crop is a central component of smallholders' risk reduction strategy. The traditional cash crop sector includes cotton, tobacco, cashews, sugarcane, and tea. An estimated 16 percent of rural households engage in cash crop production.[35] Cashews are primarily a smallholder crop, whereas sugarcane and tea are plantation crops. Smallholders also grow cotton and tobacco, mostly under contract farming arrangements.

The composition of agricultural production in Mozambique is changing in significant ways (Figure 11). In 1990–92, the value of cassava production alone exceeded the combined value of the next 10 agricultural products. By 2010–12, although cassava remained the dominant source of farm revenue, growth in revenue from tomatoes, sweet potatoes, sugarcane, and tobacco far exceeded the growth in revenue from cassava. Maize and livestock production became more important as well, which reflects the shift occurring in dietary patterns as incomes rise. On average, about 75 percent of calories consumed per person still come from cereals and starchy roots and tubers, but per capita consumption of protein (meat and seafood) is growing faster than consumption of cereals and starches (Figure 12).

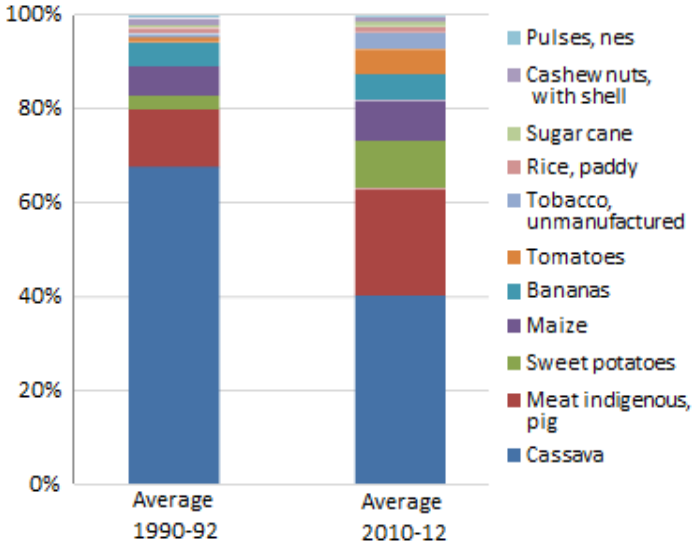
[33] World Bank (2014h).
[34] World Bank (2006b).
[35] World Bank (2006b).

TABLE 4: GROSS PRODUCTION VALUE IN MOZAMBIQUE (CONSTANT US$ 2004–06 MILLIONS)

Item	Average (1990–92)	Average (2010–12)
Cassava	457	1,184
Meat indigenous, pig	81	668
Sweet potatoes	19	296
Maize	42	252
Bananas	34	163
Tomatoes	7	154
Tobacco, unmanufactured	5	101
Rice, paddy	10	42
Sugarcane	3	34
Cashew nuts, with shell	10	26
Pulses, nes	5	13

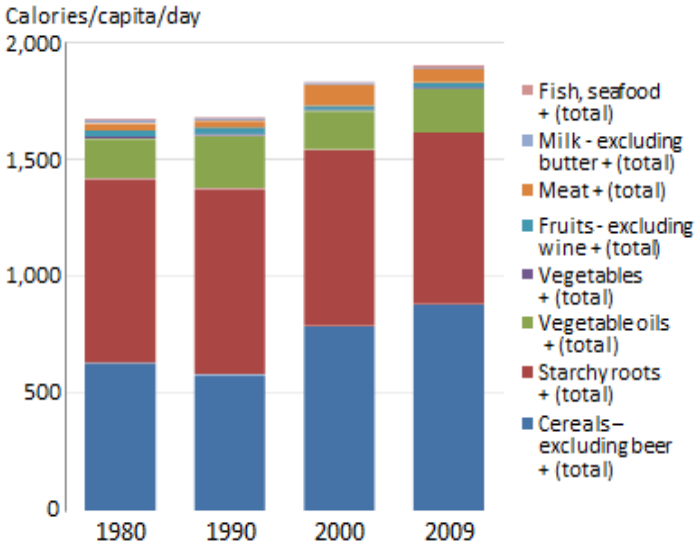
Source: FAOSTAT (FAO 2014).

FIGURE 11: TOP SOURCES OF FARM REVENUE IN MOZAMBIQUE, 1990–92 AND 2010–12



Source: FAOSTAT (FAO 2014).

FIGURE 12: DAILY PER CAPITA CONSUMPTION OF CALORIES IN MOZAMBIQUE, 1980–2009



Source: FAOSTAT (FAO 2014).

Food and agricultural exports constitute about 21 percent of national merchandise exports, and the composition of agricultural trade has changed substantially since the early 1990s (Table 5). Imports of wheat and vegetable oils (palm and soybean oil) have grown significantly, while maize imports declined after domestic maize production increased. The export base has diversified well beyond the relatively narrow range of commodities exported in the early 1990s. Today, tobacco and sugar are the largest agricultural exports, followed by sesame seeds, cotton lint, and cashews.

TABLE 5: MOZAMBIQUE'S TOP IMPORTS AND EXPORTS BY VALUE (2005 US$ THOUSANDS)

Imports	Average (1989–91)	Average (2009–11)	Exports	Average (1989–91)	Average (2009–11)
Wheat	30,048	101,348	Tobacco, unmanufactured	n/a	167,204
Oil, palm	24,714	48,387	Sugar, raw centrifugal	7,642	86,450
Food prep nes	n/a	42,967	Sesame seed	n/a	34,287
Sugar, refined	21,589	41,179	Cotton lint	8,300	30,640
Oil, soybean	3,349	30,905	Cashew nuts, shelled	16,781	18,533
Maize	69,241	24,659	Flour, wheat	n/a	12,418
Cake, soybeans	n/a	20,077	Molasses	20*	10,745
Meat, chicken	1,535	18,969	Bananas	50*	8,272
Tobacco, unmanufactured	1,259	17,940	Sugar, refined	n/a	5,467
Sugar confectionery	n/a	13,509	Groundnuts, shelled	190	4,190
Wine	4,309	13,388	Cottonseed	n/a	3,486
Cigarettes	n/a	11,512	Maize	n/a	3,134

Source: Authors' calculations, based on FAOSTAT (FAO 2014) and World Development Indicators (World Bank 2014h).
Note: * denotes that data were not available for all years.

Smallholders' participation in the main crop markets

CASSAVA

Mozambique produces both sweet and bitter cassava varieties.[36] Sweet varieties are mostly consumed fresh; the bitter varieties account for 90 percent of production and are processed into flour because of their higher levels of cynogenic glycosides. Ninety percent of the cassava consumed in Mozambique is consumed as flour.

Cassava is a perennial crop, generally harvested in small lots throughout the year. For about a decade starting in the late 1990s, a severe outbreak of cassava brown streak virus limited cassava production, particularly along the northern coast.[37] Subsequent testing and release of tolerant varieties and distribution of improved cuttings by a variety of NGOs has helped production to rebound.[38]

Most cassava is consumed by the farm household. Only about 11 percent of production is marketed on average, compared to 16–18 percent of the maize crop.[39] Farmers in the northern provinces account for 85 percent of national cassava production and more than 90 percent of the marketed volume. In 2008, they produced an average 554 kilograms of cassava per household and sold about 20 percent. In contrast, the average production in southern provinces is 172 kilograms per household; market sales are about 6 percent of production. Households in the central provinces produce 11 kilograms on average and market about 3 percent of their production.[40]

Cassava is marketed either as dried roots or flour. On-farm processing involves peeling, sometimes followed by fermentation in the shade for 4–5 days, and always followed by long-term sun-drying on raised platforms or on the ground. Farm households that do not ferment their cassava sun-dry the roots for up to two months to volatilize hydrogen cyanide.[41] Women dominate on-farm processing—peeling, fermenting, drying, producing *rale* (toasted flour)—and market retailing. Men undertake most of the assembly trade, wholesaling, storage, and milling.

Farmers sell to a large network of itinerant buyers who come to their farms or to rural assembly markets. Cassava markets are competitive. Barriers to entry are low, and large numbers of traders participate. Many small-scale traders, usually young men with modest working capital, dominate the short-term trade. Traders purchase in surplus zones and sell in regional wholesale markets. Dried cassava can be stored for 6–10 months. Due to large seasonal price swings, some farmers retain stocks on the farm for sale during the rainy season, when prices are highest, but most farmers sell during the dry season, when

[36] This section draws largely on Donovan et al. (2011).
[37] Donovan et al. (2011).
[38] Donovan et al. (2011).
[39] Donovan et al. (2011).
[40] Donovan et al. (2011).
[41] Donovan et al. (2011).

roads are easily passable, to earn cash for school fees and farm inputs for the coming planting season.[42]

Most cassava traders in northern Mozambique move cassava, particularly dried cassava, from low-cost zones to high-price markets in coastal cities. Regularly monitoring prices by cell phone, traders identify the most profitable market destinations and take advantage of opportunities for spatial arbitrage. Storage depots and warehouses are clustered at major crossroads leading out of the surplus zones or on the fringes of large urban markets. The owners of these storage depots, some of whom are also millers, are the major source of financing for the cassava trade. These entrepreneurs profit from spatial price arbitrage and from seasonal storage. As prices can swing as much as 100 percent between the dry season lows and the rainy season highs (3–8 months later), seasonal storage is one of the most profitable segments of the cassava value chain.

Rapid urbanization and changing dietary patterns are causing cassava consumption to decline, while consumption of wheat- and rice-based foods has almost doubled since 2000 from 10 percent to 20 percent of staple food consumption. Even so, the increasing demand for processed convenience foods implies that commercial opportunities will emerge for cassava-based foods, feeds, and starches. Commercial production will require better processing technology, however, including the mechanization of labor-intensive operations (peeling, grating, and pressing) as well as technical work on the biochemistry of cassava fermentation, food safety, and food quality.

CASHEWS

Mozambique was once a world leader in cashew production, accounting for 35–40 percent of global exports.[43] In 1975 Mozambique exported about 22,000 tons of processed (shelled) cashews and about 66,000 tons of raw (unshelled) cashews. In 2011 the export figures stood at about 3,500 tons of shelled nuts and 36,000 tons of nuts with shell.[44] Mozambique's export position declined for several reasons detailed here, including civil conflict during the 1980s, export policy changes, failed liberalization of the processing sector, the difficulties of intensifying production systems based on smallholder ownership of trees, and rapidly expanding production in a number of competing countries.

Following independence in 1975, cashew plantations and processing plants were nationalized. In 1978, raw cashew exports were banned to encourage domestic processing. The ban reduced producer prices, and exports crashed. By 1990/91, Mozambique was exporting only a small amount of processed cashews (about US$ 15 million), and by 1993/94, farmers' share in export prices had declined to almost 15 percent. Reforms instituted in 1991 following the civil war included privatization of factories and the National Cashew Institute (Instituto Nacional do Caju, INCAJU). Starting in 1991/92, Mozambique exported limited quantities of raw nuts, but producers first had to sell the raw nuts to processors. Although the government removed all quantitative

[42] Donovan et al. (2011).
[43] This section is primarily based on Aksoy and Yagci (2012) and African Cashew Initiative (2010).
[44] FAO (2014).

restrictions on exports in 1994, it continued to protect the domestic processing sector by introducing a graduated export tax, equivalent to about 30–32 percent of the FOB export value. The export tax was reduced to 14 percent in 1996/97 and then raised to 18 percent in 1999, where it has remained, effectively taxing farmers while significantly subsidizing processors. The tax revenues go to INCAJU, which is now a semi-governmental organization charged with using the revenues to benefit cashew farmers.

In 2001 global cashew prices collapsed and exports declined. The capital-intensive processing sector practically ceased to operate in 2002. Between 2001 and 2008, Mozambique's cashew exports consisted mainly of raw cashews. The share of processed cashews began to increase during the late 2000s with the entry of new, labor-intensive processing factories that were more economically scaled. Most of the new factories are located close to production centers to minimize transport costs.

Improved efficiency in the processing industry has not been complemented by an increase in supply, however, largely because support to the smallholder sector—which produces the bulk of the crop—has been so much lower than required. For the most part, smallholders do not see cashews as a commercial crop, and husbandry practices are poor.

Almost 42 percent of farmers (about 1 million farmers) in Mozambique own cashew trees. Small-scale farmers typically own about 20 trees,[45] which occupy marginal, unirrigated land that is unsuitable for annual crops or other tree crops. Cashew trees survive dry spells much better than other tree crops such as citrus, but most cashew trees are old and diseased, so yields are low[46] (about 2–4 kilograms per tree) compared to the potential yield of 8–10 kilograms. Smallholders cannot afford to buy seedlings to renew tree stocks, and they lack family labor to replant and tend the trees properly.[47] The absence of an effective extension service also contributes to smallholders' lack of interest in replanting aged trees to raise yields.

Smallholders sell small quantities of nuts and face uncompetitive marketing channels. Farmers sell to small local traders, bigger trading companies, or directly to the factories, but in most cases several intermediaries separate producers from processors or exporters, which reduces profits for producers. No comprehensive quality system is in place. Generally there is little differentiation between raw cashew nuts of good and poor quality, although some factories are slowly starting to pay a premium for raw nuts of better quality, graded at the farm level. Prices vary by season and not according to the quality of the product.

Poorly maintained roads work to keep farm-gate prices low, especially in remote areas, by making transportation costs very high for traders. In addition to these inefficiencies, the export tax further reduces prices. Smallholders could potentially attain premium prices in the world market by exploiting market niches (such as selling Fair Trade–certified nuts),

[45] Aksoy and Yagci (2012).
[46] World Bank (2006b).
[47] On average, 10–35 percent of production is consumed at home, according to Aksoy and Yagci (2012).

but to benefit from such markets, farmers must form effective producer organizations that provide extension services to members and help coordinate marketing.

Some cashew farmers are gaining in productivity. Since the early 2000s, INCAJU has focused on improving production by increasing replanting rates, improving access to chemicals that prevent powdery mildew disease, and developing four new varieties. The new varieties begin to yield in only three years and yield better than current varieties. INCAJU supplies the first 20–30 seedlings free and offers the remainder at cost.[48] The institute also sprays approximately 4.5 million trees (about 10 percent of the total), provides chemicals to farmers at half of the cost, and gives sprayers to local service providers so that farmers can engage them on a commercial basis to spray crops. Despite these efforts, production of planting materials is insufficient to meet the need for replanting (an estimated 9 million seedlings per year). Only a fraction of that number is produced and distributed at subsidized prices by INCAJU.

Replanting and grafting require farmers to forgo income from cashews for 3–5 years. New plantings are generally grown alongside other crops that provide some food and income in the meantime, but even with rising cashew prices and greater availability of higher-yielding varieties, it is difficult to convince farmers to replant.[49]

Cross–cutting issues impacting smallholders' access to markets

GOVERNANCE AND INSTITUTIONS

Figure 13 shows changes in five key governance indicators for Mozambique between 2002 and 2012. These Worldwide Governance Indicators are based on data reflecting local perceptions of various aspects of governance, gathered through surveys and other assessments by survey institutes, think tanks, NGOs, international organizations, and private firms.

FIGURE 13: GOVERNANCE INDICATORS FOR MOZAMBIQUE, 2002 AND 2012

Source: Worldwide Governance Indicators (World Bank 2014i).

The voice and accountability indictor is meant to capture perceptions about whether a country's citizens can participate freely in public discourse and participate in choosing their government. The rule of law indicator reflects perceptions of whether society's rules are applied equally and whether property rights and

[48] Aksoy and Yagci (2012).
[49] Aksoy and Yagci (2012).

individuals' rights are protected by courts and the police. The regulatory quality indicator has to do with perceptions that the government can implement sound policies that promote private sector development. Government effectiveness relates to perceptions about the government's ability to deliver public services and formulate and execute sound policies. Fiduciary stewardship captures perceptions about the government's ability to control grand and petty corruption and to block efforts to use public position for private gain.[50]

As the figure shows, Mozambique lags behind most of the 218 countries covered by the Worldwide Governance Indicators. Rankings for voice and accountability and the rule of law have seen some improvement, yet in 2012 the country's ranking on government effectiveness fell by over 10 percentage points compared to 2002. Mozambique also fared less favorably on measures of regulatory quality and fiduciary stewardship in 2012.

The Cost of Doing Business study[51] reports on a separate set of perceptions about the strength of the institutions Mozambique has put in place to support the business environment. The indicators are constructed from business surveys, focusing on business regulations. Overall, Mozambique ranks 139th out of 189 countries covered by the surveys. Mozambique ranks in the top half of surveyed countries with respect to starting a business and protecting investors but scores poorly when it comes to perceptions about contract enforcement and access to finance.

A recent study of the enabling environment for agribusinesses in Mozambique concludes that the overall agribusiness policy environment is reasonably conducive to private sector investment, yet much of that investment is made by foreign firms—domestic investors face steep credit constraints.[52] Government regulations and taxes are considered excessive, and the legal and regulatory framework affecting agriculture is perceived as somewhat inconsistent, opaque, and subject to interpretation by individual government officials.

In Mozambique, food crops such as cassava and maize have received hardly any government support or intervention, whereas other crops, such as cashews, have been subject to heavy intervention. Policies such as the 18 percent tax on raw cashew exports caused producers to receive a very modest share of the export price (39 percent from 2006 to 2009) and have limited their incentives to replant aging trees.[53]

Input policies have had little impact on smallholder farmers, because their use of inputs such as fertilizer and improved seed is so low. In a recent survey, stakeholders maintained that seed legislation and regulations were adequate to regulate the seed industry, but public sector capacity to implement regulations was inadequate.[54] Mozambique has limited legal ability to protect plant breeders' rights. Its public institutions have

[50] Kaufmann, Kraay, and Mastruzzi (2009).
[51] World Bank (2013b).
[52] World Bank (2012a).
[53] World Bank (2012a).
[54] World Bank (2012a).

insufficient capacity for breeding new varieties, maintaining seed, and conducting seed quality inspections—they lack breeders, other qualified staff, equipment, and financial resources. Linkages between extension and farmers are poor, which may partly explain why traits valued by smallholders are not sufficiently taken into account by breeders. Farmers in Mozambique know about improved varieties, but improved seed is hard to find and costly, while traditional varieties are perceived to have better resistance to drought, field pests, and storage pests. Smallholder farmers prefer to plant a mix of varieties as a hedge against the failure of a single variety.

Mozambican farmers use very little fertilizer. Unlike some neighboring countries, Mozambique does not subsidize fertilizers, although it has implemented input subsidy schemes in the past and has reportedly considered operating a national voucher scheme.[55] The private sector imports virtually all of the fertilizer used in the country; 93 percent is applied to tobacco and sugarcane and less than 4 percent to food crops. As mentioned, sugarcane is primarily a plantation crop, while some smallholders do grow tobacco under contract farming arrangements. The average farmer has little or no incentive to use fertilizer because fertilizer prices are far higher than prices of grains such as maize. No fertilizer regulations were in place in 2012.

INFRASTRUCTURE

Key power, telecommunications, and irrigation infrastructure is underdeveloped. Despite some recent investments, Mozambique's road density is the lowest in southern Africa, and strategic investments linking rural roads to agricultural production areas remain limited.[56] Of Mozambique's 37,000-kilometer road network, only about 6,000 kilometers are paved. If the network were in good repair, an estimated 41 percent of the rural population would have access to roads (measured as those living within 2 kilometers of any road). In fact, the poor condition of the network means that a much smaller share of the rural population has reliable, all-year access—only 11 percent, according to the government's Performance Assessment Framework. Poor roads contribute to high vehicle operating costs, high transport costs, and low traffic volumes, posing major constraints to agricultural areas.

ACCESS TO FINANCE

The risks imposed by rainfed cropping systems, failure to repay subsidized loans for agriculture, and land tenure issues make most financial service providers reluctant to lend for agriculture. [57] Mozambique's lack of rural finance is pervasive even by African standards—85 percent of agricultural groups are reportedly excluded from access to financial services.[58] Not even 14 percent of rural households are located within 30 minutes' travel time to a formal financial institution; more than 34 percent must travel more than 3 hours to reach one, and 2 percent must travel more than a day. Just 2.4

[55] World Bank (2012a).
[56] World Bank (2012b).
[57] World Bank (2012b).
[58] Hunguana et al. (2012).

percent (around 91,200) of Mozambique's 3.8 million farms reportedly accessed credit, generally through input suppliers.

FOOD SAFETY AND QUALITY

Food safety and quality affect smallholder farmers' access to markets in several ways and are equally important for crops grown for domestic consumption and export. As discussed, post-harvest processing is critical to ensure that cassava, Mozambique's most important food crop, is safe to consume. More generally, a 2008 assessment found Mozambique's phytosanitary controls to be weak and highlighted the need to strengthen its plant health services, develop capacity to undertake pest risk analysis, update the national pest list, develop national surveillance programs, and establish and/or maintain pest-free areas in accordance with international requirements.[59] The same study identifies opportunities to expand small-scale cashew processing, which would require farmers and processors to comply with internationally recognized systems, such as Good Agricultural Practice (GAP) and Hazard Analysis Critical Control Point (HACCP), and to respect limits on mycotoxin contamination and pesticide residues.

Lessons for OIC countries

The case of Mozambique highlights the urgent need for better roads and finance to reduce marketing costs and for better processing technology to open marketing opportunities for a wide range of products intended for domestic consumption and export. The study points to the significant potential benefits that would arise from putting in place enabling policies, grades and standards, and access to improved technology (planting materials), inputs, and extension services for smallholders.

Nigeria

Competitiveness and sustainability issues

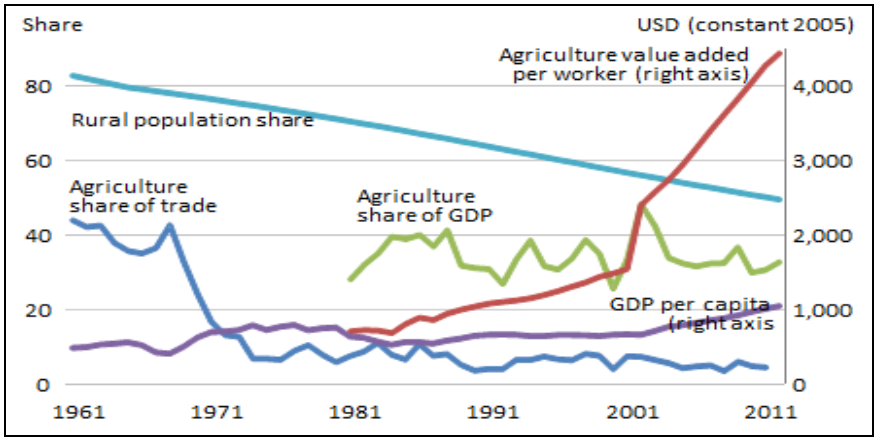
Agriculture accounts for about 22.4 percent of Nigeria's GDP and has grown at a relatively strong rate in recent years—5.6 percent in 2011 and 4 percent in 2012.[60] Crops account for 85 percent of agricultural GDP, followed by livestock (19 percent), fisheries (4 percent), and forestry (1 percent). More than 90 percent of Nigeria's agricultural output comes from smallholder farmers operating holdings under two hectares**.** The three predominant production systems[61] reflect Nigeria's very diverse agriculture. *Medium- and high-potential mixed systems in the humid south* are dominated by cassava, yam, maize, and tree crops. *Medium- and high-potential mixed systems in the semi-arid middle belt* are dominated by maize and sorghum. *Low-potential livestock-based systems in the arid north* are dominated by livestock, millet, and sorghum. Cropping systems are primarily rainfed; less than 1 percent of cultivated area is irrigated.

[59] Standards and Trade Development Facility (2008).
[60] World Bank (2014h).
[61] World Bank (2006a).

Following the upsurge of oil exports beginning in the mid-1970s, "Dutch disease" effects associated with strong appreciation of the national currency dampened growth and undermined competitiveness in many non-oil sectors, including agriculture. When the real exchange rate stabilized after the mid-1980s, most of Nigeria's once-thriving agricultural exports (cocoa, cotton, groundnut, palm oil products, and rubber) had suffered a devastating setback, from which many have yet to recover (Figure 14).[62] Today agriculture and food exports account for a mere 5 percent of merchandise exports, compared to 36 percent in 1970.[63]

Agriculture provides the primary livelihood for about 38 percent of Nigeria's population. Poverty is concentrated in rural areas; the rural poverty rate is 69 percent, versus a national poverty rate of 63 percent. Poverty declined between 2003–04 and 2009–10, although not nearly as fast as would be expected from Nigeria's pace of economic growth.[64] Well-functioning agricultural markets could significantly increase incomes and reduce poverty among Nigeria's smallholder farmers.

FIGURE 14: STRUCTURAL CHANGE AND THE NIGERIAN ECONOMY, 1960–2012



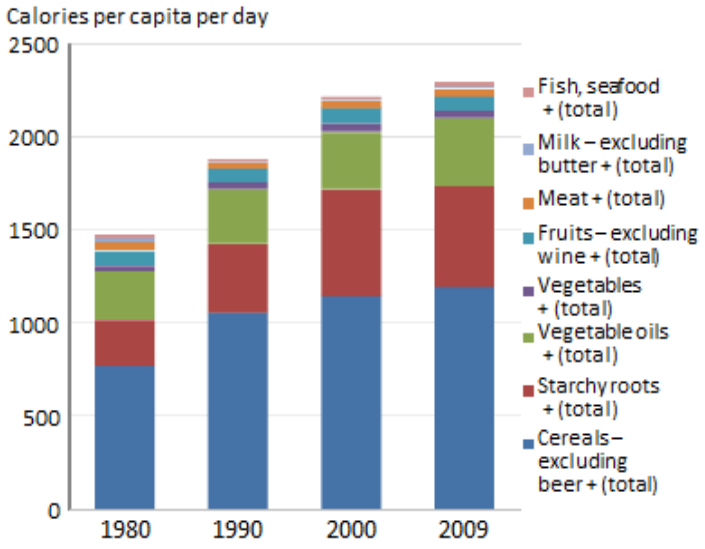
Source: World Development Indicators (World Bank 2014h).

Demand and market size

Average daily per capita calorie consumption in Nigeria increased by 49 percent between 1980 and 2009, driven mostly by rising consumption of starchy roots, vegetables, cereals, and vegetable oils (Figure 15). Consumption of fish and meat changed little over that period, while average daily consumption of calories from dairy products actually declined. In terms of farm revenues, cassava is the most important crop, followed by maize and citrus (Table 6).

[62] World Bank (2006a).
[63] World Bank (2014h).
[64] World Bank (2013d).

FIGURE 15: DAILY PER CAPITA CONSUMPTION OF CALORIES IN NIGERIA, 1980–2009



Source: FAOSTAT (FAO 2014).

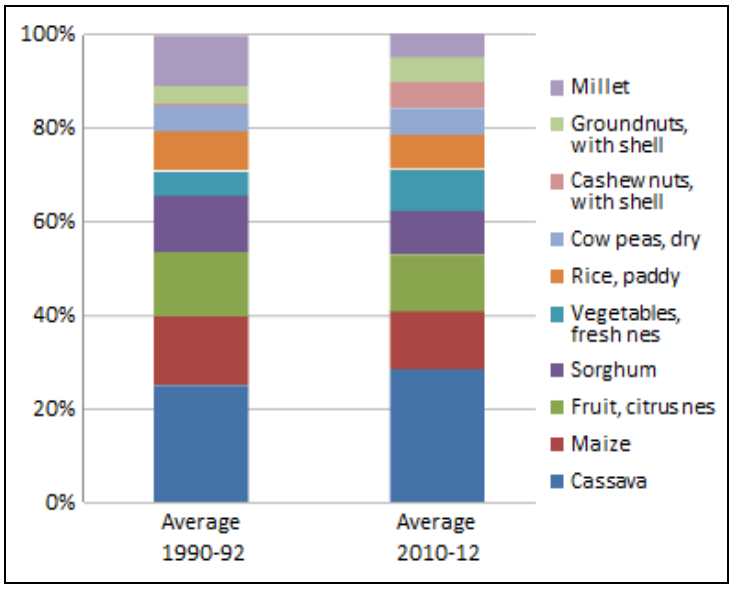
TABLE 6: GROSS PRODUCTION VALUE IN NIGERIA (CONSTANT 2004–06 US$ MILLIONS)

Item	Average (1990–92)	Average (2010–12)
Cassava	4,135	8,297
Maize	2,429	3,662
Fruit, citrus nes	2,251	3,530
Sorghum	2,001	2,710
Vegetables, fresh nes	865	2,603
Rice, paddy	1,407	2,172
Cow peas, dry	888	1,667
Cashew nuts, with shell	83	1,601
Groundnuts, with shell	615	1,581
Millet	1,779	1,481

Source: FAOSTAT (FAO 2014).

The composition of Nigerian diets may not have changed dramatically over the last few decades, but the composition of agricultural production and trade experienced noticeable change. Between 1990–92 and 2010–12, the share of farm revenue from cashew nuts, vegetables, and groundnuts expanded considerably, while the share of millet shrank (Figure 16). Imports of wheat, palm oil, sugar, and prepared foods grew significantly. Cocoa has remained the most important export crop, followed by rubber. Exports of sesame seed grew vigorously (from a fairly low base) in the early 1990s.

FIGURE 16: TOP SOURCES OF FARM REVENUE IN NIGERIA, 1990–92 AND 2010–12



Source: FAOSTAT (FAO 2014).

TABLE 7: NIGERIA'S TOP IMPORTS AND EXPORTS BY VALUE (2005 US$ THOUSANDS)

Imports	Average (1989–91)	Average (2009–11)	Exports	Average (1989–91)	Average (2009–11)
Food prep nes	33,300	220,584	Cocoa, beans	185,271	617,245
Food preparations, flour, malt extract	n/a	224,749	Rubber, natural dry	49,363	127,228
Wheat	31,663	1,148,904	Sesame seed	1,399	107,811
Oil, palm	n/a	978,667	Cocoa, butter	12,650	50,611
Sugar, raw centrifugal	7,591	428,467	Cigarettes	n/a	29,336
Milk, whole dried	19,052	289,418	Cotton lint	2,721	25,958
Sugar, refined	125,506	197,391	Cocoa, powder and cake	1,078	22,272
Tomatoes, paste	67	140,731	Rubber, natural	18,664	18,030
Milk, skimmed dried	34,044	94,372	Bran, wheat	n/a	16,902
Tobacco, unmanufactured	8,606	63,941	Vegetables, fresh or dried nes	41*	10,453
Tallow	13,454	55,452	Ginger	1,006	10,261
Meat, chicken	119*	51,260	Oil, palm	27	9,971
			Cake, palm kernel	10,032	8,761

Source: Authors' calculations, based on FAOSTAT (FAO 2014) and World Development Indicators (World Bank 2014h).
Note: * denotes that data were not available for all years.

Given the importance of cassava and cocoa for domestic consumption and exports, respectively, smallholder farmers' participation in markets for these two commodities is examined in more detail below.

Smallholders' participation in the main crop markets

CASSAVA

Nigeria is the world's largest cassava producer; at about 45 million tons, national cassava production represents about 18 percent of global production.[65] From about 1990, after a Presidential Initiative on domestic food security focused attention on cassava's potential as a foreign exchange earner, cassava production increased rapidly to exceed domestic consumption. Nigeria exports cassava mostly in the form of starch and dried cassava, primarily to other African and Asian countries.[66]

The Nigerian cassava market consists of a more traditional, food-oriented market and a newly emerging industrial market, which uses cassava to produce pharmaceutical products, feed, and confectionary flour.[67] More than 90 percent of processed cassava is used by small-scale entrepreneurs to make traditional foods (*gari, fufu*).[68] Cassava can be left in the field for a long time, but once harvested, the roots are susceptible to rapid physiological deterioration; after about 48 hours, they have little market value. Waxing or storage in plastic bags following the application of fungicide can delay deterioration, but fresh cassava generally cannot be transported and marketed over long distances. The bulkiness of cassava roots and the costs of loading and unloading them add to the difficulty of transporting them.[69]

Cassava contains up to 70 percent water. It also contains cynogenic glycosides and requires effective processing to be safe for consumption. Processing greatly reduces its bulk and extends its shelf-life, but processing facilities must be located in villages close to production centers. Cassava processing is labor-intensive and time-consuming. Small-scale processors operate with marginal profitability, because they cannot obtain credit to buy better processing equipment or improve inadequate storage facilities, which contribute to large post-harvest losses. The capacity for farmers to chip, grind, and dry cassava effectively at the farm level would add value and facilitate marketing to bulk purchasers.

In the dry cassava value chain, cassava is processed into flour and starch and sometimes further processed into industrial flour, starch, feedstuffs, and glucose, among other products. With additional processing, cassava can be transformed into ethanol. If cassava is to undergo transformation for higher-end markets, its quality must be high. Even industrial processing is only marginally profitable, owing to difficulties with financing, poor transportation, shortages of raw material, high production costs, and low demand for

[65] FAO (2014).
[66] Liverpool et al. (2009).
[67] Liverpool et al. (2009).
[68] UNIDO, CBN, and BOI (2010).
[69] UNIDO, CBN, and BOI (2010).

processed products. The considerable water and energy required for industrial processing drive production costs even higher.

Coordination among actors in the cassava value chain is weak. Outgrower schemes could potentially give buyers better access to more raw material that meets their quality criteria, but recent experience with contract farming to supply two large cassava processing operations provides a cautionary insight into the economics of contract farming arrangements. In 2012 in the aftermath of widespread flooding, cassava prices more than doubled because of a supply shortfall. Contract farmers whose production was not affected by the flooding expected to receive the higher market prices for supplying their buyers (the processors), yet the higher prices made operations uneconomical for the processors. Realizing that their businesses would not be viable with highly variable raw material costs, the processors acquired large tracts of land to produce well over half of their raw material requirements under mechanization.[70]

COCOA

Nigeria is the fourth-largest cocoa exporter in the world, and cocoa is Nigeria's most important agricultural export, valued at US$ 894 million in 2011.[71] Most cocoa is exported as beans (valued at US$ 786 million in 2011), but some is processed and exported as cocoa butter (US$ 64 million) and cocoa powder and cake (US$ 43 million).[72] Cocoa is primarily produced in the southern states of Ondo, Cross River, Osun, Ekiti, and Abia.

Under the structural adjustment programs of the mid-1980s, the government began to abolish agricultural commodity boards, liberalize export markets, reduce foreign exchange restrictions, and devalue the currency. Nigeria's cocoa industry has not fared very well in the post-liberalization phase. The use of inputs (particularly fertilizers) has declined, efforts to rehabilitate and replant aging cocoa farms are limited, and the quality of the beans has declined. The emergence of a largely uncoordinated private trade following liberalization reportedly has lessened quality controls and export coordination. Problems in enforcing contracts discourage forward sales and limit the availability of credit for upgrading technology and practices.

Farmers decide where to market their cocoa harvest based on several criteria, including the time of payment, mode of payment, price of product, distance from farm, transportation costs, and grading of product. In Osun State, farmers prefer to sell to itinerant buyers, because poor roads have made transport costs so high. Production can be rejected or the price reduced if buyers find the quality of beans to be inferior, so many producers prefer to sell to intermediaries.[73] As more intermediaries become involved in the supply chain, however, cocoa marketing becomes less remunerative for smallholder farmers.

[70] World Bank (2014a).
[71] FAO (2014).
[72] FAO (2014).
[73] Ogunleye and Oladeji (2007).

Yields are low because of the age of cocoa trees (60 percent of cocoa farms are reportedly over 40 years old),[74] the lack of labor, and the lack of improved R&D infrastructure. If cocoa farmers could aggregate their produce through cooperatives, traders would find it beneficial to engage with them, but farmer organizations are weak and poorly coordinated. Smallholders require both technical and business training if they are to manage cocoa farms as (modern) businesses, especially given the growing demand for certification and traceability in the cocoa supply chain. It can be done; in 2011, SARO Agro-Allied Ltd, a Nigerian cocoa exporter, partnered with a leading global cocoa processor, ADM, to support about 2,000 Nigerian cocoa farmers to attain UTZ certification.[75] The rate of certification is expanding as other major cocoa buyers increase their commitment to and support for certification, and as favorable prices and good marketing opportunities make certification attractive for farmers. Local cocoa processors are constrained by insufficient working capital and by erratic power supplies (discussed later).

Cross-cutting issues impacting smallholders' access to markets

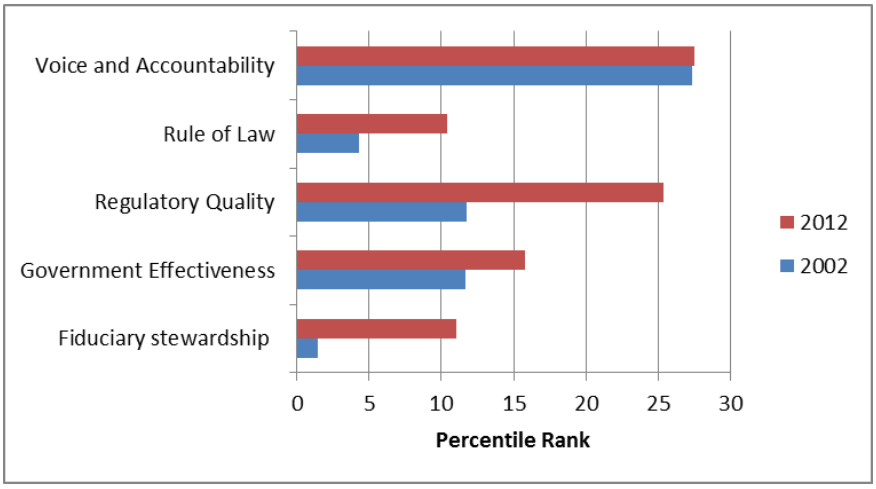
Inefficiencies downstream in supply chains reduce the returns to smallholder farmers. Low productivity at the farm level is exacerbated by post-harvest losses, which tend to be higher in Nigeria than in many comparable countries—as much as 20–30 percent higher for many perishable crops. Losses are high for several reasons, including the technical inefficiency of much of the machinery used for agricultural processing (which contributes to very low physical product transformation rates), the poor condition of many storage facilities on and off of the farm (which contributes to high levels of physical losses and reduces quality during storage), and widespread pilferage (which leads to further physical losses).

GOVERNANCE AND INSTITUTIONS

Figure 17 shows changes in five key governance indicators for Nigeria between 2002 and 2012. These Worldwide Governance Indicators are based on data reflecting local perceptions of various aspects of governance, gathered through surveys and other assessments by survey institutes, think tanks, NGOs, international organizations, and private firms.

[74] Cadoni (2013).
[75] USDA-FAS (2014).

FIGURE 17: GOVERNANCE INDICATORS FOR NIGERIA, 2002 AND 2012



Source: Worldwide Governance Indicators (World Bank 2014i).

The voice and accountability indictor is meant to capture perceptions about whether a country's citizens can participate freely in public discourse and participate in choosing their government. The rule of law indicator reflects perceptions of whether society's rules are applied equally and whether property rights and individuals' rights are protected by courts and the police. The regulatory quality indicator has to do with perceptions that the government can implement sound policies that promote private sector development. Government effectiveness relates to perceptions about the government's ability to deliver public services and formulate and execute sound policies. Fiduciary stewardship captures perceptions about the government's ability to safeguard public resources and to block efforts to use public position for private gain.[76]

As the figure shows, in 2012 the government was perceived to have significantly improved regulatory quality, the fiduciary stewardship, the rule of law, and government effectiveness compared to 2002. Even with those improvements, however, Nigeria ranks in the bottom 30 percent of the 218 countries covered by the Worldwide Governance Indicators.

Public sector investment in agriculture is low and declining. Just 3 percent of public spending went to agriculture on average between 2006 and 2012, well below the 10 percent goal set by African leaders in the Maputo Agreement.[77] Budgetary allocations by state governments are lower still—and can reasonably be considered indicative of the relatively low priority that public officials assign to agriculture, despite its proportionately large contribution to overall GDP. The ratio of public expenditure on agriculture to the sector's share of GDP between 2005 and 2012 was 0.04, whereas a ratio of 1 would indicate that public spending is commensurate with agriculture's contribution to the country's economy.

[76] Kaufmann, Kraay, and Mastruzzi (2009).
[77] World Bank (2014f).

A recent study finds that frequent and unpredictable changes in government policies, subsidies, and procurement procedures send confusing signals to agribusinesses and generate uncertainty that undermines investment in agriculture.[78] The study found that unclear division of responsibilities between federal, state, and local governments contributes to duplication, omissions, and a lack of policy coherence.

The Cost of Doing Business study[79] reports on a separate set of perceptions about the strength of the institutions Nigeria has put in place to support the business environment. The indicators are constructed from business surveys, focusing on business regulations. Overall, Nigeria ranks 147th out of 189 countries covered by the surveys. When asked about how well laws and regulations protect investors, Nigeria falls into a large middle range of countries. However, respondents complain that the Government does not do enough to enforce contracts.

The government is seeking to improve its policy framework through the Agricultural Transformation Agenda Program, which aims to reduce the dependence on imports and transform Nigeria into a net exporter of agricultural products; the government's role is to provide an environment that enables the private sector to lead the transformation.[80] Recognizing the widespread shortcomings in earlier programs to improve access to key inputs such as seed and fertilizer, the new agenda features sweeping reforms in the fertilizer and seed sectors. Both sectors have been liberalized, thereby ending the government's direct role in procuring and distributing these inputs. Supported by a program called the Growth Enhancement Scheme (GES), private dealers now sell seed and fertilizer directly to farmers and have introduced other measures, such as selling inputs in smaller packages, which are having a positive impact. Nigeria also developed an Electronic Wallet (e-wallet) system that delivers vouchers for subsidized seed and fertilizer directly to farmers' mobile phones. Farmers use the electronic vouchers to purchase inputs from registered agro-dealers across the country (for details, see 5 in Chapter 3).[81] In 2014, almost 10 million farmers were enrolled in the new input subsidy program and redeemed fertilizer and/or seed through the e-wallet and other value chain support programs.

INFRASTRUCTURE

The high cost of Nigeria-produced commodities erodes the profitability not only of primary production activities but of post-harvest activities to add value. High primary production costs translate directly into higher costs for processing firms that rely on domestically sourced raw inputs. Processing costs are further increased by unreliable power supplies, which often disrupt production runs and require processors to buy generators, as well as by high labor costs, which result from a poorly skilled labor force and high employee turnover (a particularly acute problem). The cost of producing cassava

[78] World Bank (2014f).
[79] World Bank (2013b).
[80] Adesina (2013).
[81] Adesina (2013).

starch, for example, is 30 percent higher in Nigeria than in Thailand, one of the world's leading starch producers.[82]

In a recent survey of 75 companies to gain investors' perspective on Nigeria's agribusiness sector, 72 percent of respondents identified problems with infrastructure as the greatest barrier to investment.[83] Dramatic improvements in Nigeria's rural road network are needed to link farmers more effectively to input and output markets. Similarly, agribusinesses located in and around urban areas will not obtain reliable supplies of low-cost, high-quality raw materials without improved access to rural production zones. Nigeria's long internal transit times create high logistics costs for businesses.[84] The inadequate road network hinders the development of efficient trucking and transport systems to reach small farmers and facilitate agricultural marketing and agribusiness development. Sixty percent of rural roads are classified as poor, compared to 37 percent of the federal highway network. Nigeria's road density would have to rise seven-fold from its current level (97 kilometers per thousand square kilometers) to match that of India in 1950.[85] Nigeria's port infrastructure and customs facilities are undersized and overtaxed.

Smallholders tend to be dispersed over wide geographic areas that are poorly connected by roads, transport, and other infrastructure. The value chains in which they participate are also diffuse, characterized by a multitude of informal processors and traders and few points of aggregation. Physical banking infrastructure is limited in rural areas, but the penetration of mobile technology and deployment of mobile banking platforms could significantly increase smallholders' access to finance without necessitating the construction of brick-and-mortar banks.[86] As mobile phones arrive in hard-to-reach rural areas, even farmers who do not belong to cooperatives or some other kind of producer organization will have new ways to connect with lenders.

ACCESS TO FINANCE

A recent study finds that one of the main factors limiting agricultural growth in Nigeria is that most farmers have poor access to the banking system.[87] In 2012, only 14 percent of the rural population used the formal banking system, and only about 18 percent of smallholders received credit from either formal or informal sources.[88] Agriculture accounts for more than 20 percent of GDP, yet only 2 percent of the credit supplied by commercial banks goes to agriculture. Farmers, especially smallholders, face numerous barriers to obtaining financing, including the high cost of borrowing. In 2011 formal lending institutions charged 22–30 percent interest on loans to agricultural borrowers, compared to 12–14 percent for other core sectors of the economy.[89] Insufficient collateral is another major obstacle for smallholder farmers. Financial instruments such as

[82] World Bank (2006a).
[83] Federal Ministry of Agriculture and Rural Development (2013).
[84] World Bank (2006a).
[85] World Bank (2006a).
[86] Dalberg Global Development Advisors (2012).
[87] World Bank (2014f).
[88] World Bank (2014f).
[89] World Bank (2014f).

warehouse receipt systems and credit reference bureaus were still largely absent as of 2012.

FOOD SAFETY AND QUALITY

To meet the main food safety and quality challenges facing Nigeria, actions are needed on multiple fronts. They include improved awareness and understanding of food safety hazards among producers and consumers, increased adoption of GAP by producers, increased adoption of Good Manufacturing Practices (GMP) by processors, improved infrastructure and better coordination among actors in food value chains, a consistent policy and regulatory framework, and greater capacity for food safety regulators to operate.

Common food safety concerns in Nigeria include the presence of bacterial contaminants, fungal toxins, pesticides, toxic metals (sometimes arising from soil contamination), and food additives such as artificial sweeteners, butylated hydroxyl anisole (BHA), nitrates, nitrites, and food coloring, among others.[90] One way of looking at the quality of a country's domestic food systems is to look at how well its exported food products meet import standards. Rejection rates are relatively high for several categories of products exported by Nigeria, including fruit, vegetables, nuts, and seeds exported to the EU and fish, fishery products, fruit, and vegetables exported to the USA. In the EU market, Nigeria was a clear under-performer, with a rejection rate that was relatively high in relation to its share of imports. Between 2002 and 2008, the most common causes for the rejection of Nigerian food and feed products by the EU were mycotoxin contamination, unauthorized additives, microbiological contaminants, substandard product composition, heavy metals, and foreign bodies. Of the 164 rejections recorded, 54 percent were due to mycotoxins.[91] Nigeria has also had high relative rejection rates for nut and seed exports to the USA, although it is a small exporter. These statistics highlight the increasing emphasis that buyers place on food safety and quality as value chains modernize, and the urgent need for smallholder farmers to learn about and follow GAP. Failure is very likely to pose high risks for consumers and exclude smallholders from attractive market opportunities.

Lessons for OIC countries

Widespread problems of low yields, high fertilizer costs, poor transport, and insufficient agricultural R&D must be addressed for smallholder farmers to improve their access to markets, especially in light of Nigeria's agenda to reduce the nation's dependence on imports and develop more competitive exports. Traders will pursue opportunities to engage with smallholder farmers who succeed in forming stronger cooperatives and organizations to aggregate their products and purchase inputs and services. Stronger producer organizations could also help with the dissemination of inputs, technology, and training programs to improve productivity. In cocoa value chains in particular, as demand grows for certification and traceability, it is essential to strengthen farmer organizations

[90] Omokojun (2013).
[91] UNIDO, NORAD, and IDS (2010:29).

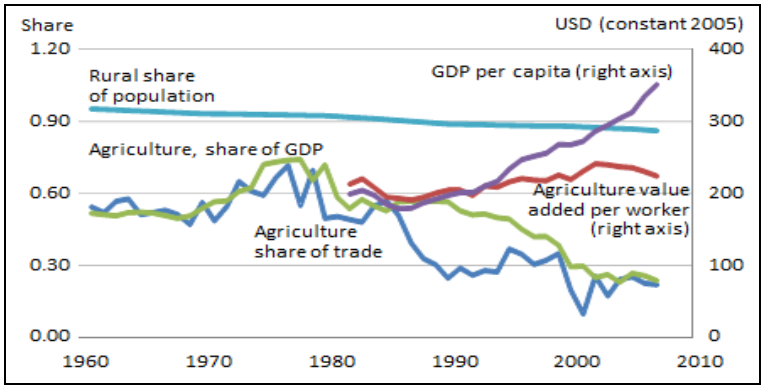
and build smallholders' technical and business skills, or smallholders will lose out on lucrative market opportunities.

Uganda

For many reasons, Uganda's economy began its structural transformation only recently. Nearly 84 percent of Uganda's population lives in rural areas and the average per capita income is just over US$ 400 per year.

The last decades of the 20th Century were turbulent times for the Ugandan people, characterized by protracted civil conflict and festering ethnic tensions. When a measure of political stability returned in the 1990s, Uganda faced a terrible HIV-AIDS crisis. More than 13 percent of the population between the ages of 15 and 49 was infected with the virus in 1992. From that time forward, however, the country has made steady progress. By 2012, the HIV infection rate had fallen to about 7 percent. National poverty rates fell from nearly 21 percent of the population in 1992 to less than 7 percent in 2009, and rural poverty rates fell from 23 percent to 8 percent during the same period.

FIGURE 18: STRUCTURAL CHANGE AND THE UGANDAN ECONOMY, 1960–2012



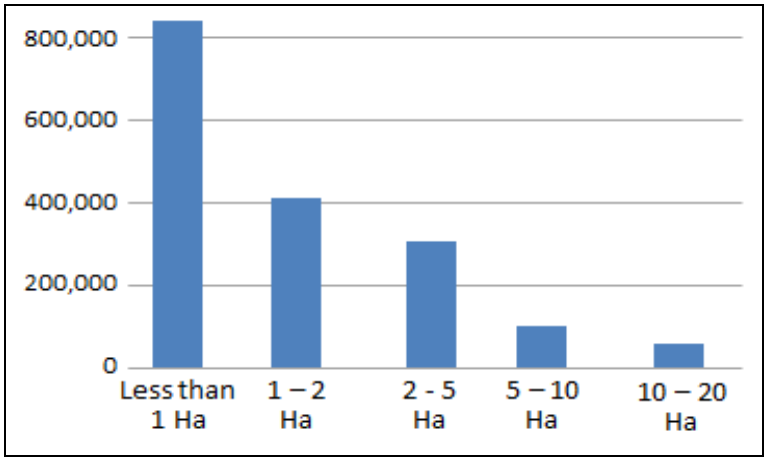
Source: World Development Indicators (World Bank 2014h).

Figure 18 illustrates key features of Uganda's changing economy. In Uganda as in other OIC member countries, agriculture's share of the overall economy and of trade declined significantly, starting in the early 1990s. For more than a decade, average incomes have grown significantly, albeit from very low levels. Still, the gap between average incomes in agriculture and in other sectors of the economy is widening, suggesting that many agricultural households are not fully participating in Uganda's growing economy.

Competitiveness and sustainability issues

Uganda's farm structure consists almost entirely of small, family-operated farms. The most recent census data (from 1991) show that most farms are smaller than 1 hectare; very few exceed 5 hectares (Figure 19). A cross-country survey of census data from FAO (2014) suggests that farm size has been shrinking rather than growing in most African countries, and recent household surveys from Uganda suggest that farms are still quite small.[92]

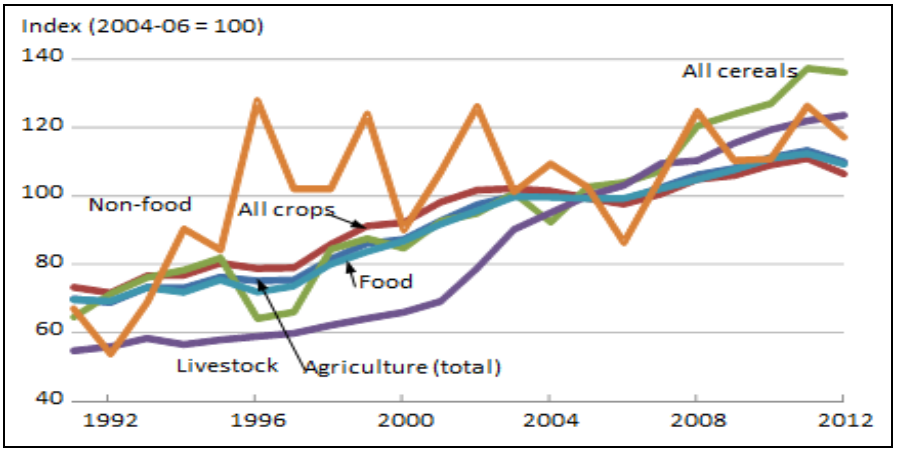
FIGURE 19: UGANDA (1991) COMPOSITION OF FARMS BY SIZE



Source: Lowder, Skoet, and Singh 2014.

Nevertheless, smallholders have managed to grow more on their small plots, and since 1990 agricultural output per capita has risen steadily. Figure 20 plots output indices from FAO over time. Livestock production and cereal production have grown steadily, lifting overall production as well. Non-food output, primarily of cotton, has held steady in recent decades, and volumes are less volatile.

FIGURE 20: PER CAPITA OUTPUT INDICES FOR AGRICULTURE IN UGANDA

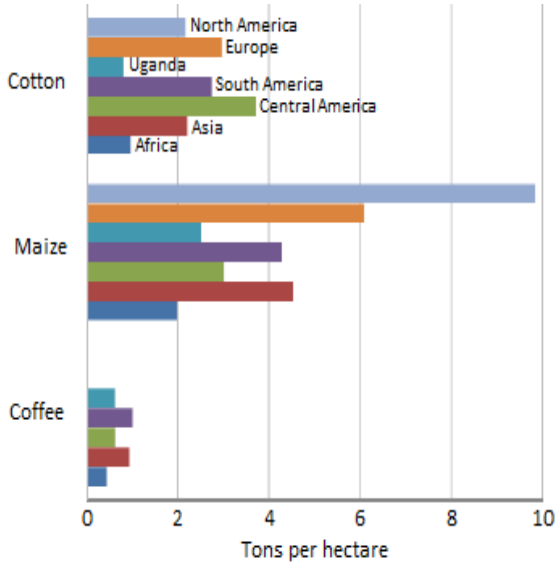


Source: FAOSTAT (FAO 2014).

[92] Larson et al. (2014).

As Uganda's land frontier closes, gains in production will rely increasingly on gains in productivity. Figure 21 shows average yields from 2007 to 2010 for three of Uganda's most important crops—maize, cotton, and coffee. Coffee yields are slightly better in Uganda than in Africa on average, yet they lag yields in Asia and South America. Yields of maize, an important staple in Uganda, are on par with maize yields in many other African countries but are significantly lower than yields in Europe and North America, where maize production is mechanized and input use is high. Similarly, cotton yields are low in Africa generally and lower still in Uganda. Experience in Asia shows that small farms can be very productive, but achieving high productivity on the small holdings in Uganda and elsewhere in Africa will require the adoption of improved technologies and better practices to manage soil fertility.[93]

FIGURE 21: AVERAGE YIELDS FOR KEY CROPS, 2007–10

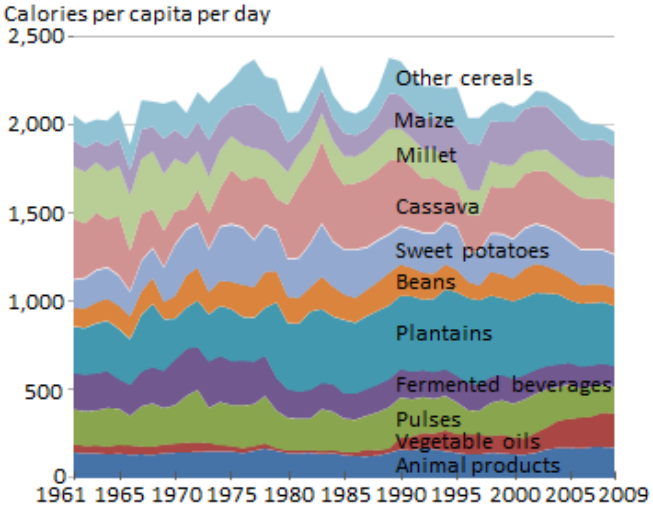


Source: FAOSTAT (FAO 2014).

Demand and market size

Although cities like Kampala are expanding rapidly, the fact that only a small portion of Uganda's population lives in urban settings means that highly developed food markets have emerged only in a few areas. Most Ugandan farmers still produce only for themselves and their immediate neighbors. The comparatively slow pace of structural change in Ugandan agriculture is reflected in the composition of Ugandan diets over time. Both average calories consumed and sources of calories have remained very

FIGURE 22: COMPOSITION OF DIETS IN UGANDA, 1961–2009



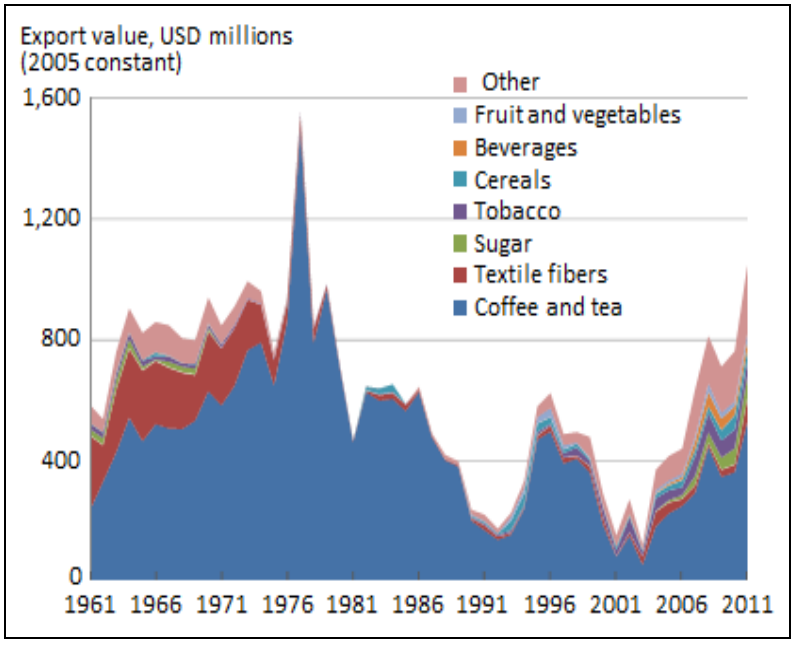
Source: FAOSTAT (FAO 2014).

[93] Otsuka and Larson (2013).

stable (Figure 22), even during turbulent times, in part because of favorable endowments of climate and land, and in part because of the generations-long strategy of self-reliance.

Historically, landlocked Uganda has been cut off from international markets. Exports have depended heavily on the prices of coffee, tea, and cotton and on weather-related production outcomes (Figure 23). Because most food was produced and consumed locally, trade in food products was limited.

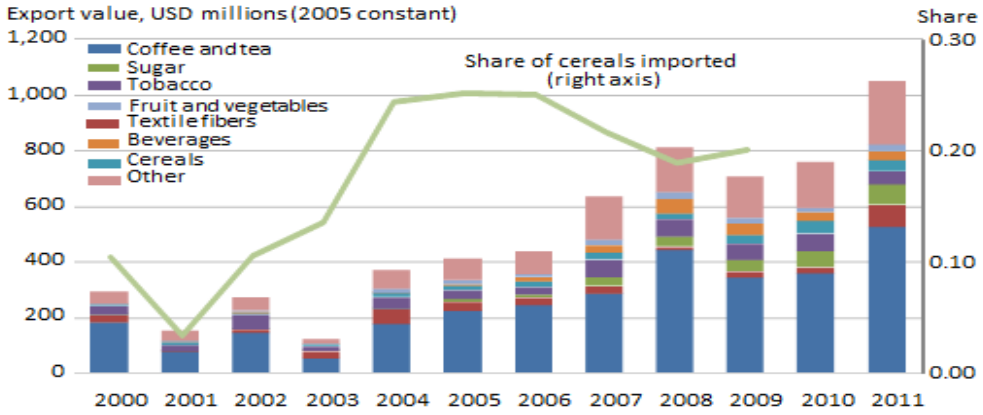
FIGURE 23: VALUE OF AGRICULTURAL EXPORTS FROM UGANDA, 1961–2012



Source: FAOSTAT (FAO 2014).

This situation is changing as internal and external trade respond to urbanization. Coffee and tea still constitute a large share of exports, but other crops have begun to matter as well (Figure 24). Although agricultural exports have declined as a share of merchandise exports, the real value of agricultural exports from Uganda has rebounded to levels that have not been seen since the late 1970s. Cereal imports, mostly of wheat and rice, have also increased. Note that cereals are less central to diets in Uganda than in most OIC member countries. The ratio of Uganda's cereal imports relative to domestic production ranged between 20 and 25 percent between 2004 and 2009, the last year for which data are available.

FIGURE 24: UGANDA'S AGRICULTURAL EXPORTS SINCE 2000

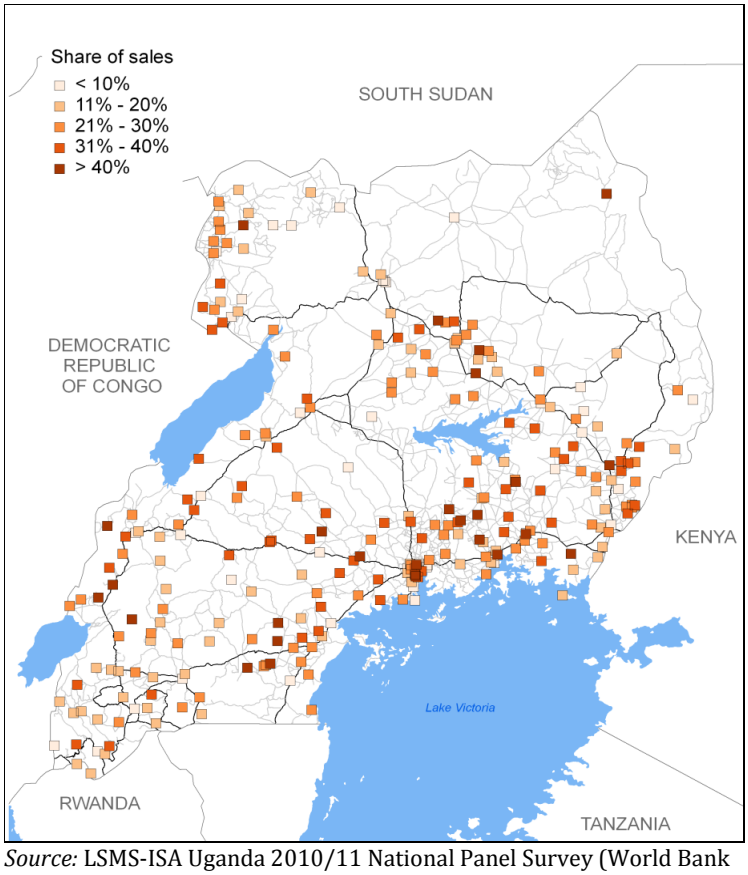


Source: FAOSTAT (FAO 2014).

Markets

Using data from a household survey in 2010, Figure 25 shows the average share of agricultural production that is sold rather than consumed at home or given to family and neighbors. The darkest squares represent clusters of households that market more than 40 percent of their agricultural output, based on value. Two aspects of the data are particularly revealing. The first is that relatively few households market all of their output, and most market less than 40 percent. The second is that households far from major roads and urban centers are much less likely to market a large portion of what they produce. In other words, poor access to roads often

FIGURE 25: ROADS, CITIES, AND MARKET PARTICIPATION IN UGANDA



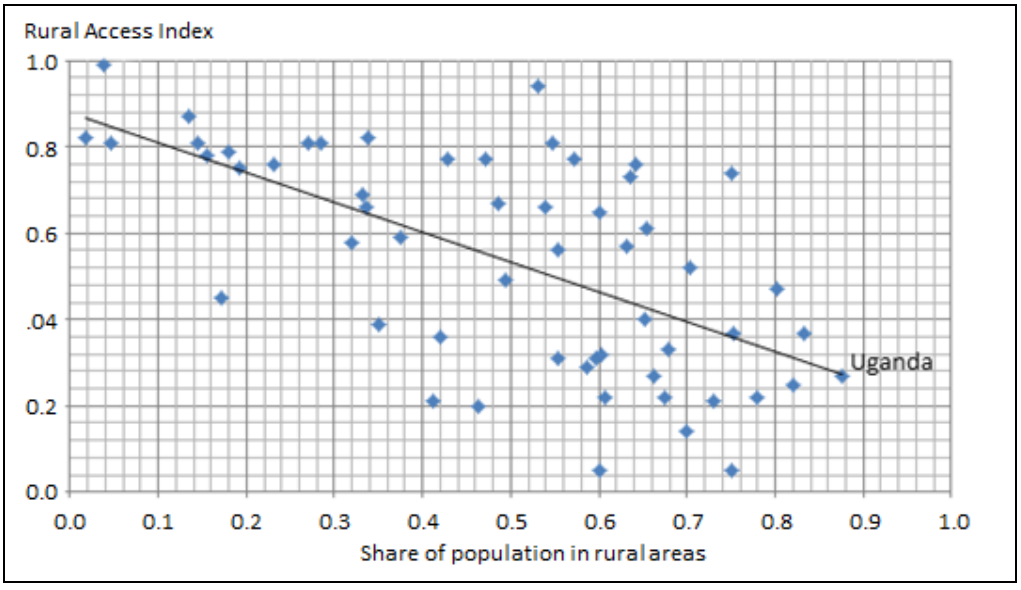
Source: LSMS-ISA Uganda 2010/11 National Panel Survey (World Bank 2012d).

implies reduced access to markets.

Urbanization may still be at an early stage in Uganda, but it appears to be accelerating. The Uganda Bureau of Statistics estimates that the urban population grew from 2 million people in 2002 to 6.4 million in 2013. The widening gap between average incomes in agriculture and the economy as a whole also suggests that incentives are in place to encourage individuals to leave agriculture for jobs in other sectors, often in or near urban centers. For this transition to work well, however, rural people must receive the education and health services that prepare them for work in other sectors. Those who remain in agriculture must find ways to connect to the growing demand for food in urban areas.

Figure 26 maps indices of market access[94] against the share of population residing in rural areas. The figure shows that greater market access accompanies a decline in the rural population. As discussed, Uganda's largely rural population has low access to markets in absolute terms, but the country is still on-trend compared to other countries for which data are available, and market access is better than in several comparable countries.

FIGURE 26: MARKET ACCESS AND RURAL POPULATION SHARE



Source: Roberts, Shyam and Rastogi 2006.

Still, the challenge of bringing more than a million small farms into domestic food chains is daunting. Uganda has no tradition of integrated food chains, and the formal contractual relationships that guarantee timely delivery to markets and safe food products are underdeveloped. As Box 1 illustrates, some firms and farmers are managing to forge solutions to those problems, however.

[94] Developed by Roberts, Shyam, and Rastogi (2006).

BOX 1: POTATOES, FAST FOOD, AND SMALLHOLDERS IN UGANDA

The Nyabyumba Farmer Group (NFG) in Kabale District recently established an on-going agreement with Nandos, a fast-food restaurant chain located 450 kilometers away in Kampala, to supply potatoes. Kabale District is well suited to potato production because its high elevation and cool climate limit potato diseases. Until 2004, NFG had done well producing seed potatoes for other farmers. Seeking new markets, the group received help from an agro-enterprise team from the International Center for Tropical Agriculture and local non-governmental organizations. NFG worked with market intermediaries to examine four marketing channels: local markets, Kampala wholesale markets, small shops in Kampala, and restaurants and supermarkets in Kampala. Eventually NFG identified Nandos, a fast-food restaurant that was purchasing 10 metric tons of fresh potatoes every month.

An agreement was reached for NFG to provide 50 one-hundred-kilogram bags of potatoes to Nandos every two weeks throughout the year. The potatoes were to be of a single variety, oval, weigh about 80 grams each, have few eyes, and be washed. A price was fixed, but no formal contract was signed.

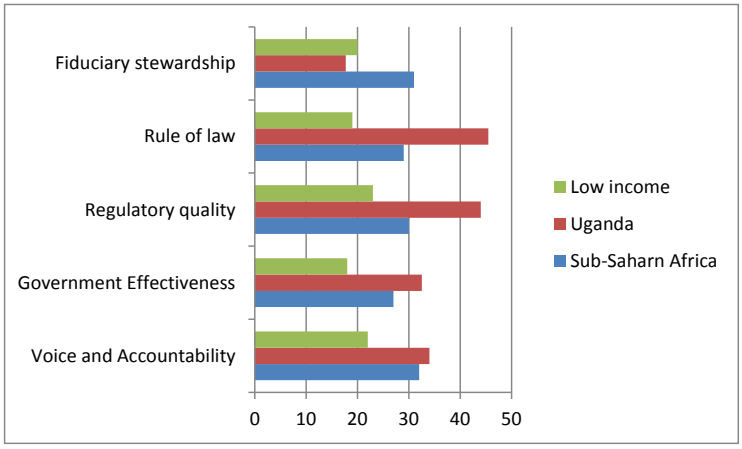
The marketing effort succeeded partly because of farmers' capacity, built through past marketing exercises and production support. Farmers had also received agricultural and other advice from Africare and potato marketing expertise from Uganda's National Agricultural Research Organization and PRAPACE, a local agency with links to the International Potato Center.

Source: Authors, based on Kaganzi et al. 2009.

Governance and institutions

The institutions needed to govern and support markets are difficult to build and expensive to maintain, yet they are fundamental to economic growth. Compared to its peers, Uganda scores well on most Worldwide Governance Indicators (which are based on data reflecting local perceptions of governance, gathered through surveys and other assessments by survey institutes, think tanks, NGOs, international organizations, and private firms). Figure 27 compares percentile rankings for perceptions of governance in Uganda compared to the averages in SSA and low-income countries. The figure reveals that the rule of law—the workings of courts, police, and other institutions to protect people and property—is perceived to be high in Uganda relative to perceptions in other low-income countries. The same is true for perceptions of regulatory quality (the set of activities needed to support private enterprise) and the government's provision of public services. In contrast, the perception of fiduciary stewardship in Uganda is lower than the average for peer

FIGURE 27: GOVERNANCE INDICATORS FOR UGANDA, SUB-SAHARAN AFRICA, AND LOW-INCOME COUNTRIES, 2012



Source: Worldwide Governance Indicators (World Bank 2014i).

countries. Still, in absolute terms, the indicators suggest that the process of institution building remains important in Uganda. In all instances, Uganda scores in the bottom half of the indicator scores.

Another perspective on the strength of government institutions comes from surveys of the business community that backstop the World Bank Group's Cost of Doing Business Indicators.[95] With urbanization, businesses step in to build the value chain linking farmers to urban consumers. A supportive and competitive business environment can lower transaction costs, benefiting both consumers and producers, as seen in the example in Box 1.

Key results from the 2014 Doing Business indicators (Table 8) are consistent with those of the Worldwide Governance Indicators. Survey respondents in Uganda rated the overall business environment better than respondents in several other African OIC member countries. Still, when compared to all 189 countries surveyed for Doing Business, the overall business environment in Uganda was perceived as relatively challenging.

TABLE 8: COST OF DOING BUSINESS RANKINGS FOR UGANDA AND SELECTED OIC COUNTRIES, 2014

	Ease of Doing Business	Starting a Business	Getting Credit	Protecting Investors	Enforcing Contracts
Kyrgyz Republic	68	12	13	22	70
Turkey	69	93	86	34	38
Azerbaijan	70	10	55	22	28
Morocco	87	39	109	115	83
Pakistan	110	105	73	34	158
Jordan	119	117	170	170	133
Indonesia	120	175	86	52	147
Egypt	128	50	86	147	156
Bangladesh	130	74	86	22	185
Uganda	132	151	42	115	117
Mozambique	139	95	130	52	145
Tajikistan	143	87	159	22	39
Uzbekistan	146	21	130	138	40
Nigeria	147	122	13	68	136
Madagascar	148	29	180	68	160
Côte d'Ivoire	167	115	130	157	88
Cameroon	168	132	109	128	175
Senegal	178	110	130	170	167

Source: World Bank 2013b.

[95] World Bank (2013b).

Access to finance

Uganda ranks significantly above other low-income countries in access to credit, scoring well compared to its peers and also in absolute terms, ranking 42 out of 189 countries. Traditional banks tend to concentrate in urban areas, where they can help businesses all along the value chain. They are less useful to businesses and farmers in rural areas, where credit flows tend to depend on informal channels or government programs.[96] The last 10 years have seen a rapid expansion of savings and credit cooperatives (SACCOs),[97] however. SACCOs focus on microcredit and small depositors, often with the backing of NGOs. Participants are relatively poor and unlikely to have other ways to access credit.

Uganda has also implemented a warehouse receipt system to facilitate commodity trade, initially in coffee. Following a set of reforms begun in 1990, Uganda opened its coffee exports to competition. Although the state Coffee Marketing Board remained in place, a large share of the coffee trade shifted to private firms, often financed off-shore. To help local exporters compete, legislators passed a Ugandan Warehouse Receipt Act, which facilitates lending against inventories held in a registered warehouse.[98]

Food safety and quality

As more food is delivered to an expanding urban population through grocery stores and fast food restaurants, private businesses will increasingly seek to promote the safety of the food they provide and protect their reputations from the fallout from outbreaks of food-borne illness. The proliferation of these new types of food suppliers will make it desirable and feasible to develop an inspection system to enforce government-legislated food safety standards. To date, however, most communities in Uganda lack formal grocery stores (compared, for example, to Latin America, where most communities have them).[99] Although the limited presence of formal grocery stores and other private food delivery enterprises means that Uganda lacks an active private mechanism to ensure food safety for domestic consumers, food exporters must nonetheless meet standards in the markets they serve, and their actions often prompt governments to take swift action on food safety.

In the case of Uganda, the need for food safety controls was highlighted when the EU imposed three consecutive import bans on fish from Lake Victoria.[100] Because food safety controls were lacking, the government and industry could not address importers' concerns when a cholera outbreak in the area raised questions about the safety of fish exported from Uganda. The crisis prompted the development and implementation of a regulatory framework. Despite this action, the framework appears to fall short of best-practice standards and places Uganda's most lucrative markets at risk.[101]

[96] As demonstrated by Mpuga (2010), using data from 1992 and 1999.
[97] Mpiira et al. (2014).
[98] Varangis and Larson (1996).
[99] Economist Intelligence Unit (2014).
[100] See the account in Bagumire et al. (2009).
[101] See Bagumire et al. (2009).

Lessons for OIC member countries

In OIC member countries where urbanization has just begun, the value chain that links producers and consumers can be tenuous, especially if the agricultural sector is made up of many smallholder farms. Methods of organization are often needed to provide the scale, quality, and reliability that enable efficient markets to develop. To a degree, informal systems of intermediaries and cash transactions will connect buyers to sellers, but such systems work less well for supermarket and restaurant buyers, who need and are willing to pay for prompt, reliable delivery and a consistently good product.

The skills and institutions required to support more formal market structures must come from investments in public institutions and actions by private groups. The domestic demand served by more formal markets and the marketing channels themselves tend to develop in tandem. Given time and a peaceful environment, more efficient value chains will likely emerge on their own, although there is some risk that a substantial portion of the rural population will be unable to participate and will remain locked in less efficient marketing channels. Farmers' success in entering higher-end markets will ultimately rest on comparative advantage. As the agricultural sector and economy evolve over time, the government's specific role in supporting formal marketing systems, and the types of support that are needed most, will evolve as well.

Strengthening the institutions that support investments along the marketing chain is important. Governance indicators suggest that compared to survey respondents in other low-income countries, respondents in Uganda view local institutions as being relatively effective. Access to credit remains an important component of the business environment, and research suggests that SACCOs are extending savings and credit markets to rural Uganda. Warehouse receipts, first established to help finance coffee exports, may also help to facilitate trade finance. This case study also highlights the need for effective food safety standards to protect farmers and fishermen who rely on export markets, along with the growing number of individuals who buy food from intermediaries.

Bangladesh

Competitiveness and sustainability issues

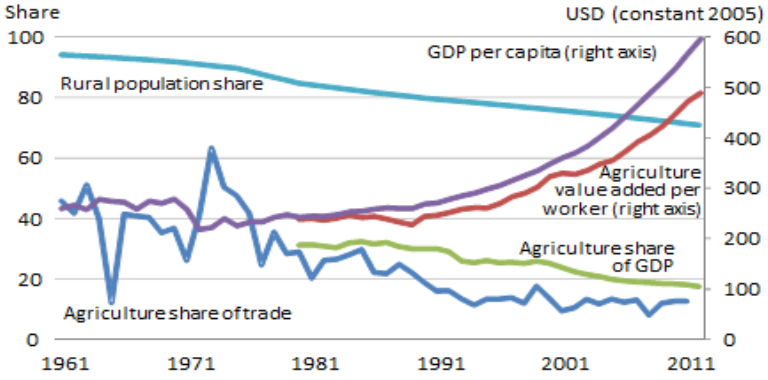
Bangladesh, with 155 million inhabitants on a landmass of 147,570 square kilometers, is among the most densely populated countries in the world. It remains a low-income country, with a per capita income of US$ 840 in 2012[102] and 31.5 percent of its population living in poverty. GDP growth has been remarkably stable, despite natural disasters and political volatility.[103] GDP grew by a healthy 5.8 percent per year between 2000 and 2009 and then by an average of 6.3 percent between 2010 and 2012. Growth has been led by the

[102] World Bank (2014h).
[103] World Bank (2010b).

industry and services sectors, while agriculture—as in other South Asian countries—has performed less well, growing at an average rate of only 3 percent.[104]

Bangladesh's economy has undergone rapid structural change since the 1990s, shifting from a predominantly rural to an increasingly urbanized base. The rural population declined from 80 percent in 1990 to 72 percent in 2010, and agriculture's share of the overall economy also declined (Figure 28). Agriculture's share of GDP was 25.5 percent of GDP in 2000; by 2012, it was 17.7 percent. Yet agriculture remains a powerful driver of economic growth and poverty reduction, employing about 62 percent of the labor force and serving as the main livelihood of the large rural population of 112 million. The national poverty headcount rate in Bangladesh declined from 48.9 percent in 2000 to 31.5 percent in 2010. Growth in farm incomes appears to have driven almost half of that poverty reduction.[105]

FIGURE 28: STRUCTURAL CHANGE AND THE BANGLADESHI ECONOMY, 1960–2012



Source: World Development Indicators (World Bank 2014h).

Net cultivated area is nearly 20 million acres. With farmers growing as many as three annual crops, cropping intensity is about 170 percent.[106] Most Bangladeshi farmers (around 40 percent in 2010) are micro/small landholders, owning less—often much less—than 1 hectare. Only 8.4 percent of farmers have more than 1 hectare (Table 9).

TABLE 9: MOST BANGLADESHI FARMERS HAVE SMALL OR VERY SMALL HOLDINGS

Holding size (ha)	Percentage of farmers
Landless or <0.02	50%
0.02–0.20 (functionally landless)	15–16%
0.2–0.6 (marginal landholders)	18%
0.6–1.0 (smallholders)	6.8%
>1.0	8.4%

Source: 2010 Household Income and Expenditure Survey, Bangladesh, as reported in World Bank 2013a.

Paddy (rice) is the most important crop grown in Bangladesh. Some farmers produce up to three rice crops each year. The summer monsoon (*aman*) crop is planted on about 5.4 million hectares (74 percent of net cultivated area). Winter (*boro*) rice is grown on 4.0 million hectares under irrigation. The *aus* crop is grown on a much smaller scale (0.9 million hectares) prior to the aman crop.[107] Other important crops include wheat, jute, and potatoes. Farmers also

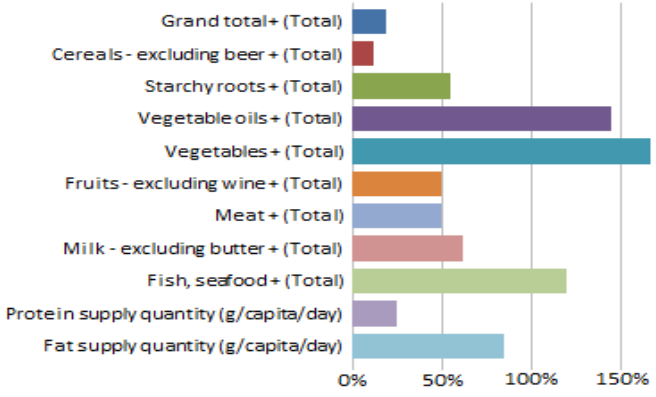
[104] World Bank (2010b).
[105] World Bank (2013a).
[106] World Bank (2010a).

grow a wide range of minor horticultural and vegetable crops. Livestock—dairy cattle, goats, and poultry—and aquaculture play very important roles in Bangladeshi farming systems as well, providing employment, cash, and improved nutrition, particularly for landless households and female farmers.

Demand and market size

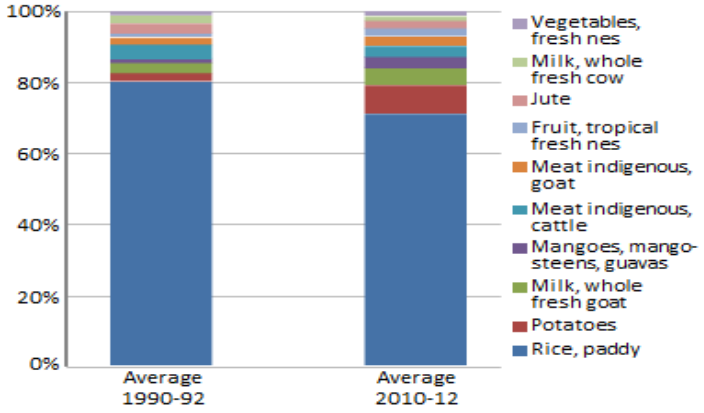
Rice continues to dominate the Bangladeshi diet, but as incomes and urbanization increase, the composition of domestic food demand is shifting away from food grains and toward high-value agricultural products, including vegetable oils, vegetables, potatoes, fish, meat, and dairy products. Between 1980 and 2009, per capita consumption of cereals increased by 13 percent, while per capita calorie consumption from vegetable oils, vegetables, and fish more than doubled (Figure 29). Cereals, which provided 83 percent of calories consumed in 1980, provided 78 percent in 2009. The growing domestic demand for high-value agricultural products, which tend to be relatively labor intensive to produce, provides significant opportunities for greater rural employment and incomes.

FIGURE 29: CHANGE IN PER CAPITA CALORIE CONSUMPTION BETWEEN 1980 AND 2009



Source: FAOSTAT (FAO 2014).

FIGURE 30: TOP SOURCES OF FARM REVENUE IN BANGLADESH, 1990–92 AND 2010–12



Source: FAOSTAT (FAO 2014).

The changing composition of production reflects these changing dietary patterns. Figure 30 compares the top sources of farm revenue in

[107] World Bank (2010a).

1990–92 and 2010–12. In 2010–12, although rice remained the dominant source of farm revenue, other agricultural products (including potatoes, milk, and fruit) garnered a greater share of earnings.

Bangladesh is a net importer of agricultural commodities; the main agricultural imports in 2011 included vegetable oils (palm oil), wheat, cotton lint, and sugar. The main agricultural exports are jute, tobacco, vegetables, and cotton waste (Table 10). Only 3.1 percent of merchandise exports consist of agricultural raw materials. Food imports as a share of merchandise imports rose steadily from 16.5 to 22.5 percent between 2000 and 2007; over the same period, food exports declined from 7.6 percent to 6.5 percent.

TABLE 10: BANGLADESH'S TOP IMPORTS AND EXPORTS BY VALUE (2005 US$ THOUSANDS)

Imports	Average (1989–91)	Average (2009–11)	Exports	Average (1989–91)	Average (2009–11)
Wheat	293,979	293,979	Jute	129,747	175,336
Oil, soybean	134,752	134,752	Tobacco, unmanufactured	2,795	52,443
Cotton lint	131,526	131,526	Vegetables, fresh nes	9,654	11,362
Milk, whole dried	76,851	76,851	Cotton waste	n/a	11,012
Peas, dry	33,829	33,829	Sesame seed	n/a	5,841
Oil, palm	27,039	27,039	Potatoes	8*	5,077
Onions, dry	16,915	16,915	Tea	53,450	4,843
Lentils	9,105*	9,105	Cotton lint	277	4,751
Sugar, raw centrifugal	1,669	1,669	Pastry	n/a	4,318
Maize	118*	118	Beverages, non-alcoholic	n/a	3,939
Cake, soybeans	5*	5	Nuts, nes	n/a	3,252

Source: Authors' calculations, based on FAOSTAT (FAO 2014) and World Development Indicators (World Bank 2014h).
Note: * denotes that data were not available for all years.

Smallholders' participation in staple food markets

RICE

Bangladesh has experienced sustained growth in rice production for the last three decades.[108] Between 1971/72 and 2007/08, rice area increased marginally from 9.3 million hectares to 10.6 million hectares, while production surged from 14.6 to 43.2 million tons. Most of the increased rice production in Bangladesh since 1980 has come from greater production of boro rice in January–May. Traditionally the aman crop was the main rice crop, grown in August–December when farmers could rely on the monsoon and seasonal flooding of rivers and streams. Prior to the mid-1980s, the boro harvest was relatively small, constituting only about 15 percent of production over 1973–80. After

[108] This section draws on World Bank (2008); this section and the next draw heavily on Reardon et al. (2012).

imports of diesel engines and pumps for tubewell irrigation were liberalized in 1988, and as more farmers came to use fertilizer and high-yielding rice varieties, boro area increased sharply. Over 1981–90, boro area expanded by an average of 7.5 percent per year, replacing the lower-yielding aus rice crop (April–August) in many areas.

Through rapid increases in rice (and wheat) production in the 1980s and 1990s, Bangladesh achieved its food grain production targets. Total production of rice and wheat grew by an average of 2.5 and 2.1 percent per year, respectively, outpacing population growth of about 1.9 percent per year. By 1999/2000, these increases in production per capita eliminated the so-called "food gap"—the difference between the amount of food grain required to meet the consumption target of 454 grams of food grain per person per day and net domestic production—and weakened the case for large flows of food aid.[109]

Increases in rice production also led to a long-term decline in domestic rice prices. From the late 1970s to the early 1990s, real rice prices fell by about 30 percent. Since the early 1990s, real rice prices on average have remained approximately constant, although with substantial fluctuations. Nonetheless, the real incomes of farmers adopting the new technology, particularly those who increased their boro rice area, generally rose. On the other hand, farmers who could not adopt the new technology (because they lacked irrigation, appropriate drainage, or had other constraints), particularly in southern and northeastern Bangladesh, may have experienced declining real incomes as real rice prices fell.

Net consumers of rice have enjoyed greater food security thanks to increased rice production and market liberalization. Lower real rice prices directly benefit net rice purchasers. Moreover, the increased size of the total rice harvest and the more even seasonal spread between the aman and boro crops have improved price stability by reducing the time between major rice harvests. Boro rice has been especially important in years when droughts or floods damaged the aman crop. Private rice imports (made possible by trade liberalization in the early 1990s) add to price stability in years when rice harvests are poor (as in 1994/95, 1997/98, and 1998/99) by keeping domestic rice prices from rising above the cost of imported rice. To keep real prices from rising and to free land for diversification into high-value crops, Bangladesh needs further increases in rice production, based on higher yields.

As is the case for staple food crops in many developing countries, the value chain for rice in Bangladesh traditionally has been "geographically long and intermediationally long."[110] Paddy is sold to village traders, who sell it as paddy or have it milled in village mills and then sell it to rural wholesale markets, where it is bought by wholesalers from cities. Those wholesalers sell on to semi-wholesalers (who sell to retailers) and/or traditional retailers.[111]

[109] World Bank (2008).
[110] Reardon et al. (2012).
[111] Reardon et al. (2012).

A recent study of rice markets in the main production zone supplying the capital city (Dhaka) finds that although this traditional value chain still dominates, an "intermediate" or "transitional" value chain is emerging, in which the role of the traditional village broker/trader is much diminished.[112] In the area surveyed for the study, only 7 percent of paddy was sold directly to the village trader; 35 percent was sold to a wholesaler or wholesale markets, 32 percent to a miller, 32 percent to a wholesaler at the mill, and the remaining 1 percent through other channels. Farmers sold about two-thirds of their paddy directly to wholesalers either at the wholesale market or mill.

The proportion of farmers selling directly to mills has grown significantly, along with the number of rice mills, which increased from 6,155 in the 1960s to 50,868 in the 1990s. The scale and technology of the mills has changed as well. During the 2000s, larger automatic and semi-automatic mills gradually began to displace the small mills.

Several factors caused the structure of the rice market to change in the study areas. They include the proliferation of rural wholesale markets; better road links to cities; better access to electricity; and the spread of mobile phones, giving farmers information about marketing options.[113] Seventy-one percent of rice farmers in the study reported using a mobile phone to contact buyers. Of the farmers that used mobile phones, 90 percent had contacted other buyers, and 58 percent had agreed to a price by phone.

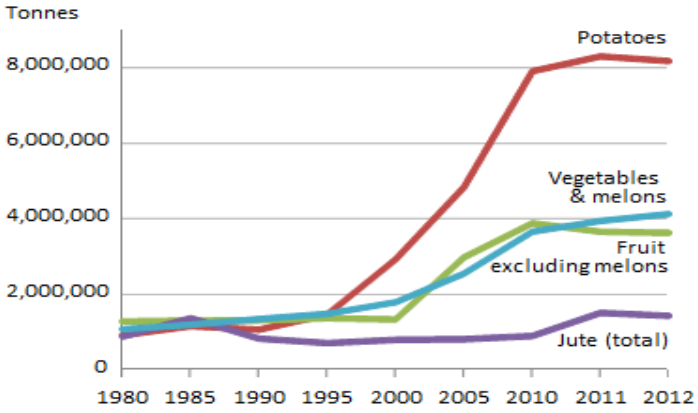
Farmers' share of total value added was higher than typically assumed, partly because village traders' role in the rice value chain was being eliminated and more farmers were selling directly to mills, and partly because mills were selling directly to city wholesale markets rather than through rural wholesalers. Farmers were able to capture 79 percent of the urban retail price for common rice. Interestingly, although farmers received a small premium of US$ 20 per ton to produce fine rice, they captured only 52 percent of the urban retail price for fine rice. When it came to sales of fine rice, the share of total margins (the urban retail price) of rural and urban wholesalers combined in the value chain jumped from 7 percent to 16 percent between the rice qualities. The gain for the miller was more modest, from 5 percent to 8 percent. The urban traditional retailer's share in total margins jumped from 8 percent to 24 percent.[114]

POTATOES

With rising incomes and urbanization, domestic demand for fruit, vegetables, and especially potatoes has surged. Per capita consumption of potatoes has risen from an average of 4 kilograms in 1973/74 to 23 kilograms today. Production of potatoes increased almost nine-fold between 1980 and 2011 (Figure 31). The rapid growth in consumption and demand for year-round supplies, together with the release and adoption of new potato varieties and improvements in infrastructure and technology, have helped to transform potato value chains in Bangladesh and multiply marketing options for farmers.[115]

[112] Reardon et al. (2012).
[113] Reardon et al. (2012).
[114] Reardon et al. (2012).
[115] Reardon et al. (2012).

FIGURE 31: POTATO PRODUCTION, 1980–2012



Source: FAOSTAT (FAO 2014).

An interesting feature of this transformation is that it has been driven by investments and actions midstream in the supply chain, among traders and cold storage facilities. This experience differs from supply chain transformations observed elsewhere, where downstream modernization in food retailing and processing, catalyzed by FDI flows, has been the transformative force.[116] Although the transformation of Bangladesh's potato value chain has been driven by domestic investments by small and medium firms in the middle of the supply chain rather than by FDI flows to downstream segments, the transformation is similar in that it has involved consolidation and technological and organizational change.

Traditionally farmers sold potatoes at harvest or within a few months of harvest (after traditional on-farm storage) to the local village market for local consumption. This value chain was "geographically short and intermediationally short." To supply urban consumers, village traders purchased from farmers and then sold to rural wholesale markets, where wholesalers from cities bought potatoes and then resold them to retailers—a "geographically long and intermediationally long" value chain similar to that for rice and wheat.

From the mid-1990s, investments in modern cold storage facilities increased because off-season demand for potatoes was growing rapidly, production was increasing, and more electricity was available as the government made major investments in the electricity grid. The growth in cold storage facilities has given rise to an "intermediate" value chain that is geographically long but has fewer intermediaries. Farmers sell fresh potatoes at harvest but keep some of the harvest in cold storage for later sale directly to city wholesale market traders. While the rural–urban traditional value chain still predominates, the intermediate chain has emerged quickly and is gaining importance. Storage offers farmers the opportunity to earn an additional 40 percent of the margin in the value chain.[117]

Several other factors have contributed to the transformation in the potato supply chain. The rapid spread of mobile phones and increased access to electricity have made potato farmers better informed about what to grow, how to grow it, and for whom. Farmers can conduct business directly with wholesalers and sidestep village traders. Agricultural research has enabled farmers to shift to white varieties that yield as much as 40 percent

[116] Reardon et al. (2012).
[117] Reardon et al. (2012).

better and reportedly store better than traditional red varieties. Introduced by the national agricultural research system in the 1970s, the white varieties appear to have been heavily adopted, spurred by incentives in the output market.[118]

Cross-cutting issues impacting smallholders' access to markets

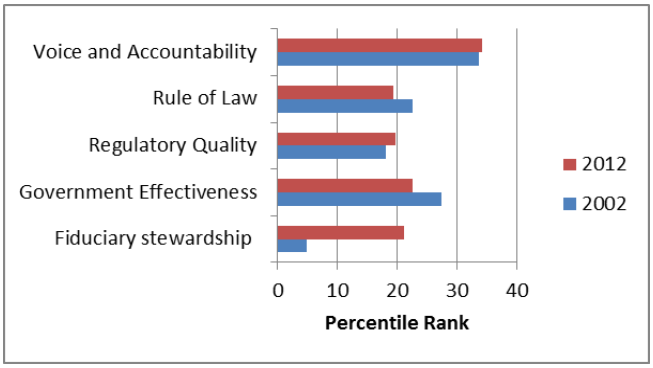
Bangladesh's recent sustained growth has rapidly increased demand for energy, transport, and telecommunications services. Despite large improvements in infrastructure—particularly for telecommunications, which has improved smallholders' access to markets—insufficient planning and investment for future growth means that Bangladesh still has a large infrastructure deficit. Less than 75 percent of the peak demand for electricity is met; during peak periods, the shortfall is more than 2,000 megawatts. Even so, per capita electricity consumption, at 160 kilowatt hours, is about one-fourth of India's and one of the lowest in the world; less than half of households have access to electricity. In transport, the country is overly dependent on a network of poorly managed and maintained roads. Only 40 percent of the main roads are estimated to be in good condition, and just 37 percent of the rural population has easy access to an all-season road, versus 69 percent in India. Bangladesh's abundant waterways are underdeveloped as cost-effective transport, particularly for the poor.[119]

GOVERNANCE AND INSTITUTIONS

Figure 32 shows changes in five key governance indicators for Bangladesh between 2002 and 2012. These Worldwide Governance Indicators are based on data reflecting local perceptions of various aspects of governance, gathered through surveys and other assessments by survey institutes, think tanks, NGOs, international organizations, and private firms.

The voice and accountability indictor is meant to capture perceptions about whether a country's citizens can participate freely in public discourse and participate in choosing their government. The rule of law indicator reflects perceptions of whether society's rules are applied equally and whether property rights and individuals' rights are protected by courts and the police. The regulatory quality indicator has to do with perceptions that the

FIGURE 32: GOVERNANCE INDICATORS FOR BANGLADESH, 2002 AND 2012



Source: Worldwide Governance Indicators (World Bank 2014i).

[118] Reardon et al. (2012).
[119] World Bank (2010b).

government can implement sound policies that promote private sector development. Government effectiveness relates to perceptions about the government's ability to deliver public services and formulate and execute sound policies. Fiduciary stewardship captures perceptions about the government's ability to control grand and petty corruption and to block efforts to use public position for private gain.

As the figure shows, Bangladesh lags behind most of the 218 countries covered by the Worldwide Governance Indicators. Ranking for fiduciary stewardship has demonstrated significant improvement and rankings for voice and accountability and the regulatory quality have also shown some positive dynamics. With this being said, the country's ranking on rule of law and, especially, government effectiveness fell between 2002 and 2012.

The Cost of Doing Business study[120] reports on a separate set of perceptions about the strength of the Bangladesh institutions put in place to support the business environment. The indicators are constructed from business surveys, focusing on business regulations. Overall, Bangledesh ranks 130th out of 189 countries covered by the surveys. When asked about how well laws and regulations protect investors, Bangladesh does well, ranking in the top 12% of surveyed countries. However does especially poorly when respondents are asked about contract enforcement.

While agriculture's share in the overall economy is diminishing, agriculture retains considerable importance in Bangladesh's rural economy, as indicated by its prominence in the government's key strategy documents. Agriculture is a central component of the inclusive growth strategy advocated in the Perspective Plan and of the national food security agenda.[121] The National Food Policy identifies 26 specific Points of Action focusing on food supply, food access, and food utilization, especially for women and children. The Country Investment Plan secures and allocates the budget to implement the National Food Policy and its Plan of Action.[122] The agricultural sector and rural economy also feature strongly in the national food security strategy framework, which emphasizes efforts to enhance research and extension, improve input markets, improve market access, and reduce marketing and storage costs.

Historically, national policies and strategies to achieve food security have been dominated by initiatives to increase food grain (principally rice) production. The inward-looking, interventionist sectoral framework and restrictive trade policy framework that prevailed at independence in the early 1970s were eventually followed by significant reforms in the 1980s and especially the 1990s. While areas for further reform remain, the current policy context is characterized by a stable macro framework, significantly reduced price distortions, a more liberalized and outward-oriented trade regime, and an emphasis on the private sector as the engine of economic growth.[123]

[120] World Bank (2013b).
[121] World Bank (2013e).
[122] Ministry of Food and Disaster Management (2011).
[123] World Bank (2013e).

The reforms, combined with investments in technology and critical regulatory changes in input markets (the deregulation of pump sets in the 1990s and the exceptions granted to import hybrid rice varieties are two examples) brought about a major transformation in Bangladesh. No longer a chronically food-deficit, food-aid-dependent country, it had become nearly self-sufficient in rice, the main staple.

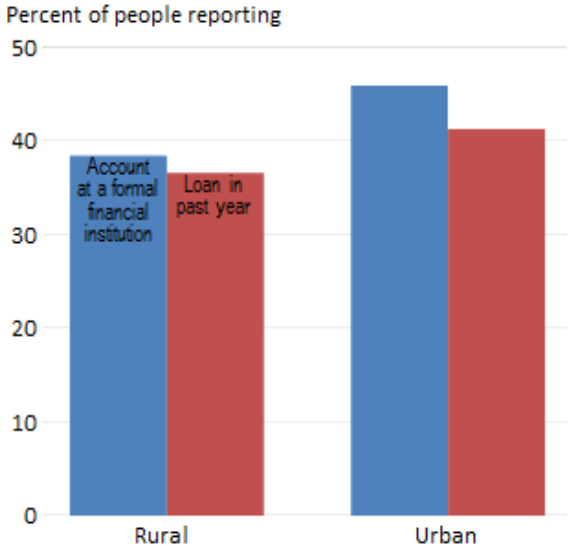
Self-sufficiency in food grains remains the central objective of national agricultural strategies. Government policies and interventions have maintained incentives—for example, output price supports and fertilizer subsidies—for domestic rice and wheat production to expand. At the same time, policies have been put into place to protect poor consumers. Sales of rice were subsidized until the early 1990s, and important, extensive safety nets have been devised, involving food for work and food transfers (in the form of wheat, for example).[124]

National trade policy has undergone major reforms. Bangladesh reduced tariffs for industrial products in the 1980s and especially the early 1990s; in the latter period, it also liberalized private trade in rice and wheat. As a result, domestic output prices for rice (the main agricultural product in terms of value) and wheat have been near border prices in most years since the early 1990s. These reforms substantially reduced pervasive price distortions in Bangladeshi agriculture, with some exceptions, such as sugarcane and chemical fertilizers.[125]

ACCESS TO FINANCE

Based on the World Bank's Global Financial Inclusion database,[126] Figure 33 depicts the share of surveyed individuals who had an account at a financial institution and the share of surveyed individuals (age 15+) who had taken out a loan. In rural and urban areas, a relatively large share of individuals had recently borrowed money; 37 percent of rural respondents had obtained a loan in the past year, compared to just over 41 percent of urban respondents. In rural areas, 38 percent of households had an account at a formal financial institution, compared to 46 percent of urban households.

FIGURE 33: FINANCIAL SERVICES IN RURAL AND URBAN BANGLADESH

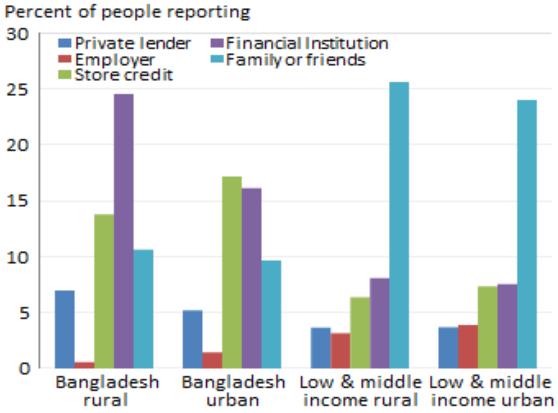


Source: Global Findex (World Bank 2014c).

[124] World Bank (2013e).
[125] World Bank (2013e).
[126] Global Findex (World Bank 2014c).

These levels of access to loans and formal financial institutions are comparable to averages across low- and middle-income countries.

FIGURE 34: CREDIT SOURCES IN RURAL AND URBAN BANGLADESH AND LOW- AND MIDDLE-INCOME COUNTRIES



Source: Global Findex (World Bank 2014c).

As seen in Figure 34, reliance on formal financial institutions is relatively high in Bangladesh compared to averages for low- and middle-income countries. Interestingly, rural residents are more likely to obtain credit from a formal financial institution than urban residents. Levels of borrowing from formal financial institutions and access to store credit in Bangladesh significantly exceed the averages for these measures across all low- and middle-income countries.

FOOD SAFETY AND QUALITY

Ensuring food quality and safety remains a significant uphill battle in Bangladesh. The country's food safety legislation was revised and updated recently, but a concerted effort is needed to enforce the law and make the corresponding upgrades in infrastructure. A number of food safety risks are commonly acknowledged in Bangladesh. They include microbiological contamination in the production and post-harvest handling systems for fruit and vegetables, as well as chemical contamination of food products—particularly pesticide contamination in fruit and vegetables, but also chemical contamination in fish and fish products.[127] Another food safety risk is heavy metal contamination, especially high levels of arsenic, lead, and cadmium in vegetables and possibly in fish and fish products. Antibiotic residues in fish and fish products, the use of illegal additives and colorants, and adulteration of various food products present additional risks.[128]

One way of assessing the quality of a country's domestic food systems is to look at how well its exported food products comply with import standards. Bangladesh has exhibited relatively poor compliance. Between 2002 and 2008, the most common reasons for rejecting food and feed imported into the EU from Bangladesh included veterinary drug residues (specifically, residues of antibiotics used in aquaculture, notably shrimp production), microbiological contaminants, substandard product composition, and mycotoxins.[129] The relative rejection rate for Bangladeshi products imported into the EU was high across all categories for which data were reported (fish and fisheries products, fruit and vegetables, nuts and seeds, and herbs and spices). Rejection rates for Bangladeshi

[127] The use of formaldehyde to preserve fish apparently is widespread. Rice millers also reportedly use urea to whiten rice.
[128] World Bank (2008).
[129] UNIDO, NORAD AND IDS. (2010).

products imported into the US were also high for all categories, except for fish and fisheries products, which was medium. [130]

Improving consumers' and producers' awareness of food safety risks and of strategies to minimize those risks would have important benefits. Several exporters, food processors, and farmers catering to export supply chains have been trained in GAP and GMP and have received HACCP and International Organization for Standardization (ISO) certification. But efforts to improve agricultural and manufacturing practices need to be mainstreamed and not confined to export supply chains. In addition to assuring distant buyers and consumers that the food products they are about to buy are safe, these quality management systems serve as early warning systems. As such, they can reduce post-harvest losses and benefit businesses by identifying shortcomings in production processes and increasing consumers' confidence in their products.

Lessons for OIC countries

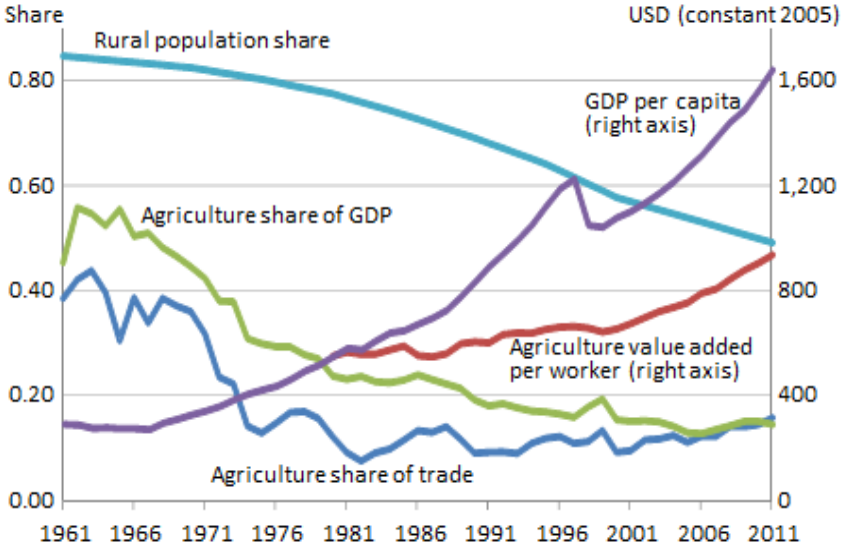
The Bangladesh case study reveals how improvements in policies and infrastructure (roads, electricity, and telecommunications), together with growing urban demand, provide powerful incentives to encourage domestic investment at critical junctures in staple food value chains. Markets for two important staples—rice and potatoes—are being transformed. Value chains have undergone a process of disintermediation, in which farmers increasingly bypass village traders to sell directly to wholesalers and realize higher margins. The case study emphasizes the importance of agricultural R&D in raising yields and capturing traits (such as better storage quality) that increase marketability. The study also demonstrates the outsized role of telecommunications in modernizing marketing and widening participation in value chains.

[130] UNIDO, NORAD AND IDS. (2010).

Indonesia

Incomes have grown rapidly in Indonesia for nearly five decades, and many of the patterns of structural transformation described in Chapter 1 are apparent (Figure 35). Nearly all of the population lived in rural areas in 1961, but by 2011 the share of the population in rural areas had fallen below 50 percent. The composition of the economy has changed over time as well. Presently agriculture accounts for about 15 percent of GDP and about 16 percent of merchandise trade. Average incomes in Indonesia are now nearly five times what they were in the 1960s.

FIGURE 35: STRUCTURAL CHANGE AND THE INDONESIAN ECONOMY, 1961–2011



Source: World Development Indicators (World Bank 2014h) and FAOSTAT (FAO 2014).

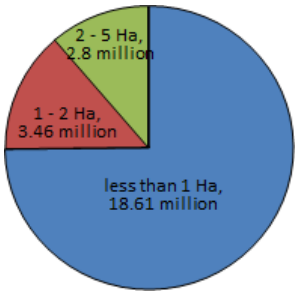
Although average incomes in agriculture have grown, the gap between average incomes in agriculture and the economy as a whole has widened. The average valued-added for a worker in agriculture is less than 60 percent of GDP per capita.

Competitiveness and sustainability issues

For Indonesia, the challenges of connecting farmers to an increasingly urban population of consumers are especially difficult. Indonesia is an archipelago nation of more than 18,000 islands, and more than half of the population lives on the island of Java, where the capital (Jakarta) is located.

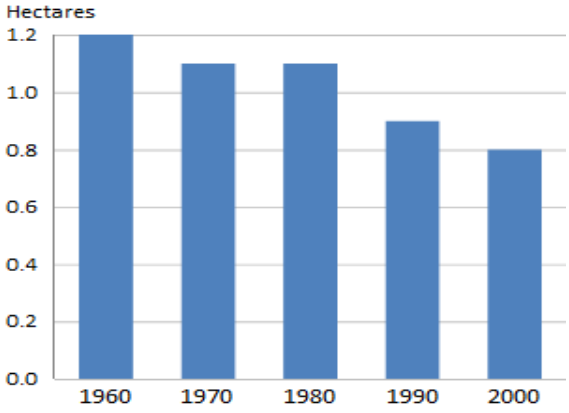
A recent study estimates that Indonesia has nearly 25 million farms.[131] The vast majority, more than 18 million, are smaller than one hectare (Figure 36). Average farm size declined from 1.2 hectares in the 1960s to 0.8 hectares in 2000 (Figure 37).

FIGURE 36: DISTRIBUTION OF FARMS BY SIZE (MILLIONS) IN INDONESIA, 2003



Source: Lowder, Skoet, and Singh 2014.
Note: Large plantation crop farms not included.

FIGURE 37: AVERAGE FARM SIZE IN INDONESIA, BY DECADE



Source: Lowder, Skoet, and Singh 2014.
Note: Large plantation crop farms not included.

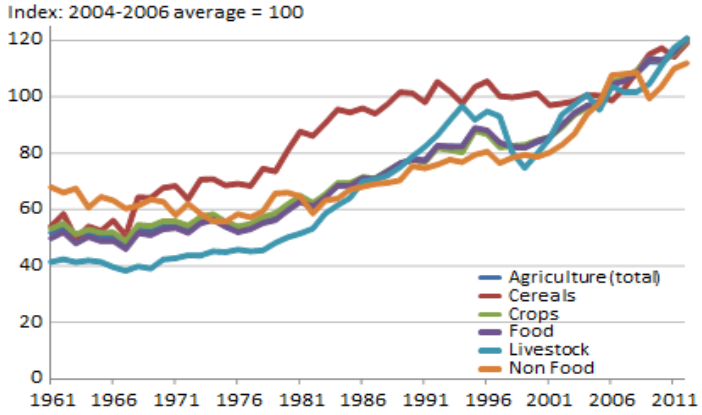
Despite the generally small scale of agriculture in Indonesia, growth in per capita agricultural production has been robust across all production categories (Figure 38). Some of this growth has come from expanding the area under production, especially the area under tree crops, as discussed later.

A key question for Indonesia is whether this rate of growth can be sustained. The expanding demand for food and forest products at home and abroad has propelled growth but has also used more of the environmental resources that sustain agriculture. It will be a continuing challenge to determine the best means of protecting the rich natural endowments threatened by rapid development and the unsustainable exploitation of

[131] Lowder, Skoet, and Singh (2014), reporting census data from 2003.

forests and marine ecosystems. In recent years, forest fires and the degradation of land and peat forests have heightened greenhouse gas emissions and threatened air quality in Indonesia and neighboring countries. The government has moved ahead with initiatives to improve governance and accountability in the forest and land sector, supported in part by a grant from Norway under REDD+, a United Nations initiative to limit greenhouse gas emissions from deforestation and forest degradation and to support conservation and sustainable forest management. The government is also working with the World Bank and other donors to improve land tenure policies, forest policies, and forest governance at the national, provincial, and district levels.[132]

FIGURE 38: PER CAPITA PRODUCTION INDICES FOR INDONESIA, 1961–2010



Source: FAOSTAT (FAO 2014).

An important consideration is that growth in total factor productivity has been strong in Indonesian agriculture, implying that much agricultural growth has come from using resources more efficiently. Table 11 compares rates of productivity growth in selected developed and developing countries. Although productivity gains have ebbed and flowed in Indonesia, the consistent improvement in agricultural productivity across five decades has been a major driver of income gains in the sector.

To sustain agricultural growth, Indonesia must protect the natural resources that support agriculture and use those resources more efficiently by achieving continued improvements in productivity. These two objectives are central to Indonesia's agricultural policy.

[132] World Bank (2014b).

TABLE 11: GROWTH IN TOTAL FACTOR PRODUCTIVITY IN AGRICULTURE, INDONESIA AND SELECTED COUNTRIES

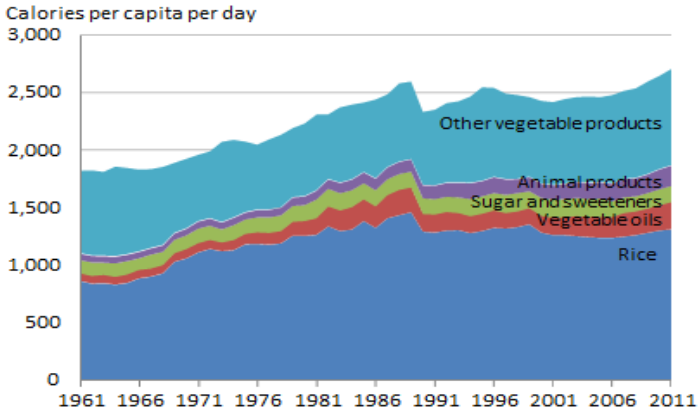
	1961–70	1971–80	1981–90	1991–2000	2001–09
Australia	0.63	1.65	1.27	2.85	0.55
Canada	1.41	–0.36	2.67	2.55	2.14
Chile	1.70	2.20	1.09	1.71	2.58
Estonia	1.40	0.19	–0.69	1.29	4.70
Northwest Europe	0.85	1.48	1.55	1.80	2.75
Southern Europe	1.97	2.03	1.30	2.42	3.04
Israel	5.65	2.74	0.95	2.41	2.57
Japan	2.42	2.17	1.11	1.51	2.43
Korea	1.83	4.28	2.81	4.04	2.86
Mexico	2.65	2.17	–1.98	3.19	2.19
New Zealand	1.47	1.39	1.84	3.20	3.14
Norway	0.92	0.91	1.18	0.56	2.37
Switzerland	0.43	1.06	0.06	1.74	2.02
Turkey	0.75	1.54	0.99	1.50	1.78
United States	1.21	1.80	1.21	2.17	2.26
Brazil	0.19	0.53	3.02	2.61	4.04
China	0.93	0.60	1.69	4.16	2.83
India	0.49	1.00	1.33	1.11	2.08
Indonesia	1.75	1.40	0.59	0.99	3.68
Russia	0.88	–1.35	0.85	1.42	4.29
South Africa	0.34	1.15	2.71	2.79	3.01
Ukraine	0.41	–0.18	1.12	–0.07	5.35

Source: OECD 2011a, Fuglie 2010.

Demand and market size

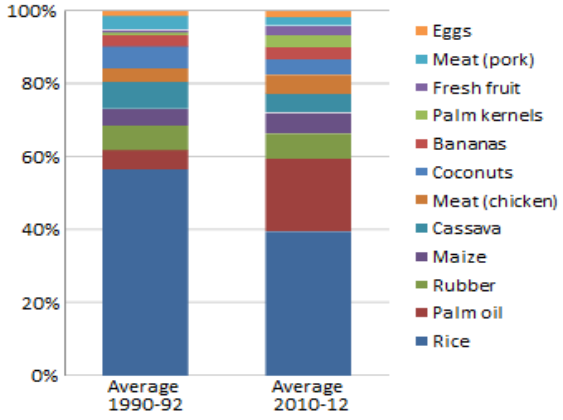
A growing population and improved incomes have driven demand for food steadily upward in Indonesia. For many years, much of that growing demand was for rice. Diets have diversified in more recent years, although rice remains a dominant source of calories in the Indonesian diet (Figure 39). The composition of production has changed as well. Figure 40 compares the top 12 sources of farm revenue in 1990–92 and 2010–12. The value of rice production alone exceeded the combined value of the next 11 crops in 1990–92. In 2010–12, although rice remained the dominant source of farm revenue, other crops, primarily oil palm, garnered a greater share of earnings.

FIGURE 39: DAILY PER CAPITA CONSUMPTION OF CALORIES IN INDONESIA, 1961–2011



Source: FAOSTAT (FAO 2012).

FIGURE 40: TOP SOURCES OF FARM REVENUE IN INDONESIA, 1990–92 AND 2010–12



Source: FAOSTAT (FAO 2014).

Markets

The composition of agricultural trade has undergone substantial change (Table 12). On the import side, wheat imports have grown significantly as bread consumption expanded with continued urbanization and income growth. Cotton, imported for the textile industry, retained its importance, while imports of feed ingredients, including soybeans, soybean cake, and maize, grew to support the expanding livestock subsector. On the export side, oil palm products are increasingly important, including exports of palm oil, which comes from the fleshy part of the oil palm fruit, as well as palm kernel oil and palm kernel meal, which come from the seed contained in each oil palm fruit. Coffee and cocoa, traditional exports, have maintained their place among the top exports.

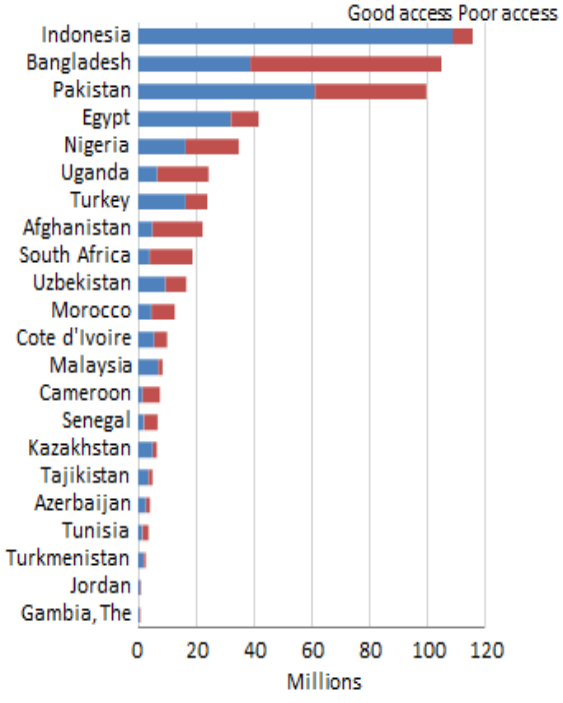
Access to markets is relatively good in Indonesia (Figure 41). Nearly 97 percent of Indonesia's rural population lives within two kilometers of an all-weather road. This achievement reflects the government's considerable effort to connect its far-flung communities.

TABLE 12: INDONESIA'S TOP IMPORTS AND EXPORTS BY VALUE (2005 US$ MILLIONS)

Imports	Average (2009–11)	Average (1989–91)	Exports	Average (2009–11)	Average (1989–91)
Wheat	1,491	429	Oil, palm	12,420	445
Cotton lint	1,118	684	Rubber natural dry	6,727	1,233
Cake, soybeans	1,058	35	Oil, palm kernel	1,491	62
Soybeans	818	211	Cocoa, beans	874	132
Sugar, raw centrifugal	755	20	Coffee, green	807	568
Maize	446	24	Fatty acids	671	8
Food prep nes	391	29	Oil, coconut (copra)	572	108
Tobacco, unmanufactured	355	57	Food prep nes	435	16
Milk, skimmed dried	328	68	Cigarettes	402	98
Sugar, refined	280	139	Fat, nes, prepared	239	1
Flour, wheat	233	9	Cocoa, butter	233	25
Meat, boneless beef and veal	206	7	Cake, palm kernel	223	28

Source: Authors' calculations, based on FAOSTAT (FAO 2014) and World Development Indicators (World Bank 2014h).

FIGURE 41: RURAL POPULATION WITH AND WITHOUT GOOD ACCESS TO MARKETS, INDONESIA AND SELECTED COUNTRIES

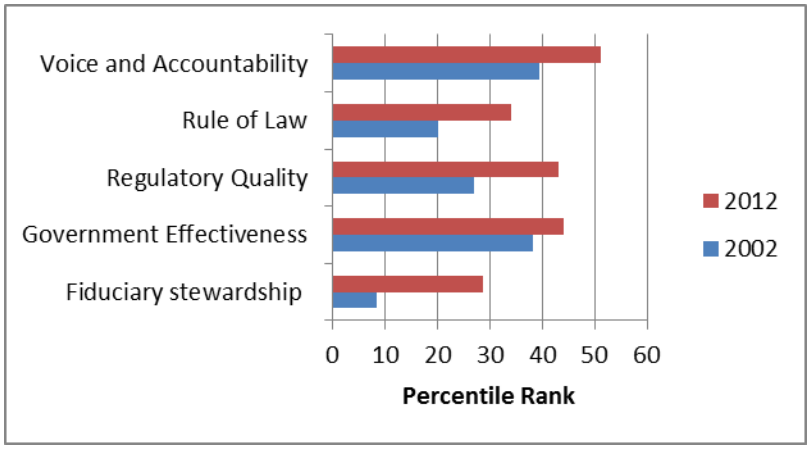


Source: Roberts, Shyam, and Rastogi 2006.

Governance and institutions

As discussed, the Government of Indonesia has taken a series of actions to bolster the management of forests, lands, and other natural endowments, and this steady progress is reflected in perceptions of governance. Figure 42 shows changes in five key governance indicators for Indonesia between 2002 and 2012. These Worldwide Governance Indicators are based on data reflecting local perceptions of various aspects of governance, gathered through surveys and other assessments by survey institutes, think tanks, NGOs, international organizations, and private firms.

FIGURE 42: GOVERNANCE INDICATORS FOR INDONESIA, 2002 AND 2012



Source: Worldwide Governance Indicators (World Bank 2014i).

The voice and accountability indictor is meant to capture perceptions about whether a country's citizens can participate freely in public discourse and participate in choosing their government. The rule of law indicator reflects perceptions of whether society's rules are applied equally and whether property rights and individuals' rights are protected by courts and the police. The regulatory quality indicator has to do with perceptions that the government can implement sound policies that promote private sector development. Government effectiveness relates to perceptions about the government's ability to deliver public services and formulate and execute sound policies. Fiduciary stewardship captures perceptions about the government's ability to control grand and petty corruption and to block efforts to use public position for private gain.[133]

The figure shows a widespread perception that the government has made strides in all five categories of governance, especially in efforts to limit corruption and improve the rule of law. Still, Indonesia lags behind most of the 218 countries covered by the Worldwide Governance Indicators, with the exception of the voice and accountability indicator.

Table 13 reports on a separate set of perceptions about the strength of the institutions Indonesia has put in place to support the business environment. The indicators are constructed from business surveys, focusing on business regulations. Overall, Indonesia

[133] Kaufmann, Kraay, and Mastruzzi (2009).

ranks 120th out of 189 countries covered by the surveys. The table does not present data on all aspects of business regulations, but it gives a sense of the unevenness of regulatory outcomes in Indonesia. For example, although Indonesia ranks in the top half of surveyed countries with respect to getting credit and protecting investors, it scores poorly when it comes to perceptions about contract enforcement and starting a business.

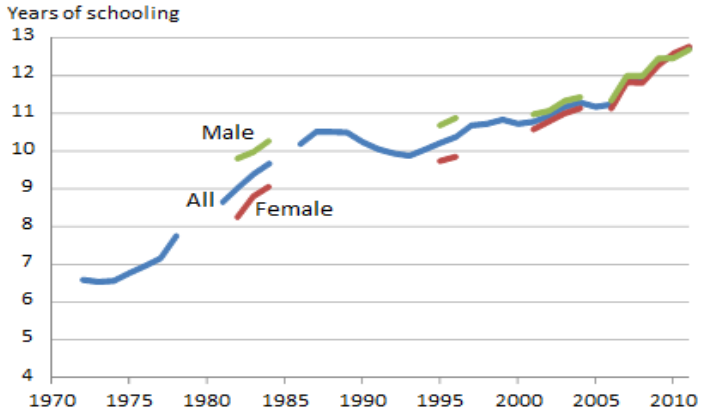
TABLE 13: COST OF DOING BUSINESS RANKINGS FOR INDONESIA AND SELECTED OIC COUNTRIES, 2014

	Ease of Doing Business	Starting a Business	Getting Credit	Protecting Investors	Enforcing Contracts
Kyrgyz Republic	68	12	13	22	70
Turkey	69	93	86	34	38
Azerbaijan	70	10	55	22	28
Morocco	87	39	109	115	83
Pakistan	110	105	73	34	158
Jordan	119	117	170	170	133
Indonesia	120	175	86	52	147
Egypt	128	50	86	147	156
Bangladesh	130	74	86	22	185
Uganda	132	151	42	115	117
Mozambique	139	95	130	52	145
Tajikistan	143	87	159	22	39
Uzbekistan	146	21	130	138	40
Nigeria	147	122	13	68	136
Madagascar	148	29	180	68	160
Côte d'Ivoire	167	115	130	157	88
Cameroon	168	132	109	128	175
Senegal	178	110	130	170	167

Source: World Bank 2013b.

As discussed, a workforce that is well trained to work outside of agriculture is an important ingredient of a virtuous economic transformation. The Indonesian government has invested heavily in education. It has closed the gender gap in education, and children entering school today are expected to stay in school for more than 12 years (Figure 43).

FIGURE 43: EXPECTED YEARS OF SCHOOLING, INDONESIA

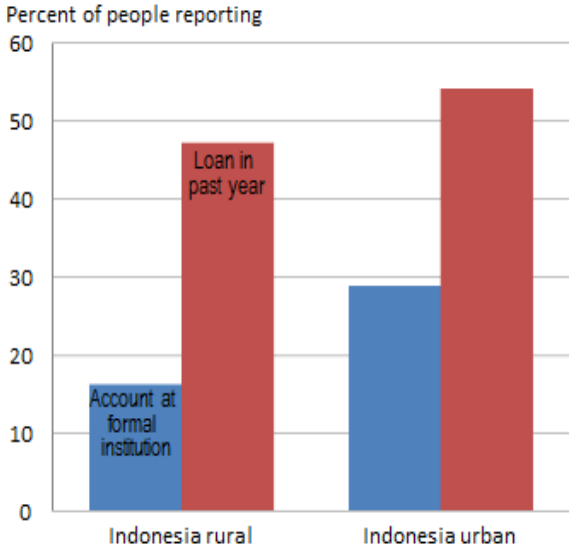


Source: World Development Indicators (World Bank 2014h).

Access to finance

As indicated in Table 13, Indonesia's financial sector has a relatively strong capacity to provide credit. Rural and urban households appear to have significant scope to tap into credit markets, although access to credit and financial services in rural areas lags access in urban areas.

FIGURE 44: FINANCIAL SERVICES IN RURAL AND URBAN INDONESIA



Source: Global Findex (World Bank 2014c).

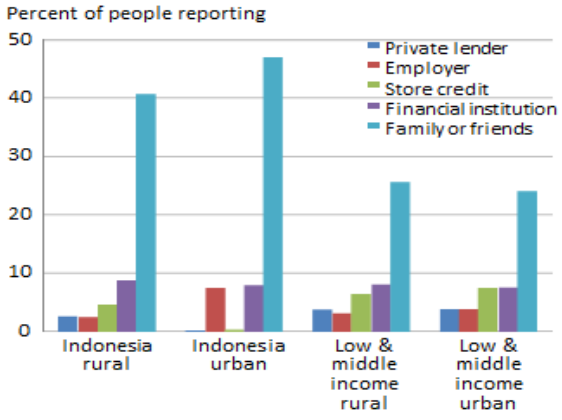
Based on the World Bank's Global Financial Inclusion database,[134] Figure 44 depicts the share of surveyed individuals who had an account at a financial institution and the share of surveyed individuals (age 15+) who had taken out a loan. In rural and urban areas, a relatively high share of individuals had recently borrowed money. Just under 50 percent of those surveyed in rural areas had obtained a loan in the past year, compared to just over 50 percent in urban areas.

[134] Global Findex (World Bank 2014c).

Access to savings services differed noticeably in rural and urban areas, however; a smaller share of those surveyed in rural areas had an account at a bank or other formal financial institution.

Figure 45 shows sources of credit for rural and urban borrowers in Indonesia as well as in low- and middle-income countries. Reliance on formal institutions in Indonesia is relatively low, although consistent with averages across the low- and middle-income countries. Rural Indonesians have more diverse sources of credit than urban dwellers—rural households are more likely to obtain credit from an employer or receive store credit. What sets Indonesia apart from other low- and middle-income countries, however, is the level of borrowing from friends and family, which is 40–46 percent in Indonesia compared to about 25 percent on average for low- and middle-income countries.

FIGURE 45: CREDIT SOURCES IN RURAL AND URBAN INDONESIA AND LOW- AND MIDDLE-INCOME COUNTRIES



Source: Global Findex (World Bank 2014c).

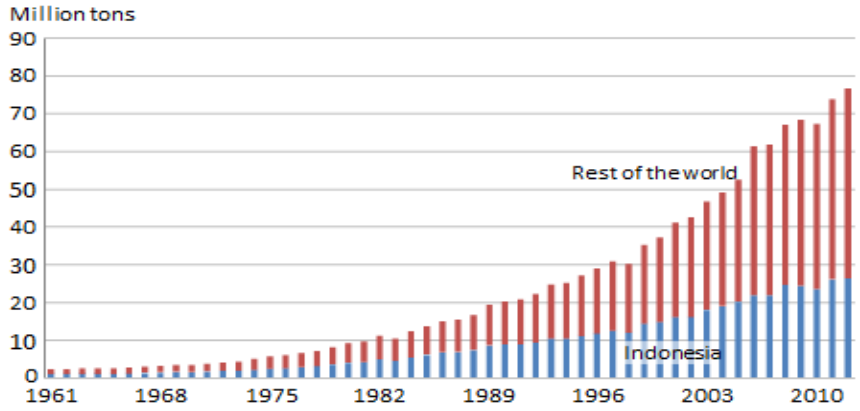
INCLUDING SMALLHOLDERS IN VALUE CHAINS FOR HEAVILY PROCESSED AGRICULTURAL GOODS: THE EXAMPLE OF OIL PALM

Many crops must be harvested and processed quickly before their quality declines and makes them unsuitable for processing. Sugarcane is perhaps the most familiar crop in this category, but another such crop is oil palm, which produces fruit that contains a kernel that must be crushed to yield palm kernel oil. Aside from its use as a popular cooking oil, palm oil can be processed into numerous specialized products used by agribusinesses and other industries.

Because fresh palm fruit spoils quickly, and because large processing plants are more cost effective, during the second half of the 20th Century oil palm was often grown on estates, where the processing facility was surrounded by fields of oil palm owned by the same

company.[135] This setup began to change with the advent of outgrower schemes in which smallholders, situated near a processing plant, produce much of the fruit. In some instances production is organized into "nucleus estates," where smallholders surround an area of plantation-managed land. Today Indonesia is the world's largest palm oil producer, accounting for nearly one-third of global production (Figure 46). Smallholders account for most oil palm production, although some oil palm is still grown on estates.

FIGURE 46: PALM OIL PRODUCTION IN INDONESIA AND THE REST OF THE WORLD, 1961–2012



Source: FAOSTAT (FAO 2014).

The integrated nature of palm oil production has created opportunities to resolve some of the traditional difficulties in smallholder production, although the structure of the production system creates challenges as well. For example, to minimize processing costs and avoid spoilage, deliveries of oil palm must be coordinated, and processors require fresh fruit bunches of uniform quality. Transporting unprocessed fruit is expensive, and the quality of palm fruit declines as travel times increase. For that reason, processing plant owners have an interest in seeing that local producers are productive, and they supply inputs and technical advice to an extent that is rare for most other crops grown by smallholders. At the same time, transport facilities often link producers to a single processing center, leaving them little choice about where to market their produce.

A recent survey of more than 1,000 smallholders in various locations throughout Indonesia finds that smallholders having contracts with a plantation company produce more—roughly 10–15 percent more—palm fruit. Among contract farmers who receive credit, 55 percent receive loans from the plantation company; another 33 percent receive loans from a bank or credit union. Independent smallholders receive about 73 percent of their loans from banks or credit unions and another 9 percent from a cooperative.[136] Yet despite the advantages of credit and assured sales, smallholders, whether under contract or not, produce fruit bunches of lower quality than those produced under management in

[135] Moll (1987).
[136] IFC (2013a).

an estate setting, partly because of their choice of planting material. In addition, smallholders are less likely to follow good sustainability practices.

To a significant degree, many problems with quality appear to be caused by gaps in communication. Because smallholders often market their produce to intermediaries that aggregate the fruit, they are unaware of quality problems that emerge when the fruit is delivered. In many cases, it is hard to disentangle quality problems that emerge on a given farm with problems originating on other farms or with subsequent handling problems.

The same study finds that pricing information is hard to come by. In general, farmers with contracts receive a better price for their produce—in some cases as much as one-third more than farmers without contracts. Traders pay promptly for what they purchase, however, and a few even pay in advance. In contrast, more than two-thirds of farmers who sell directly to the mill are paid on a monthly basis.

The study concludes that significant gains may be had by improving the flow of information to smallholders, including technical information on agronomic practices for growing oil palm. The study highlights the need to improve the transparency of pricing incentives and to give smallholders information on the penalties for providing fruit of poor quality. An additional finding is that scope exists to improve the enabling environment for credit providers.

Food safety

Indonesia's food delivery systems are changing quickly with urbanization. Between 1999 and 2005, food sales from supermarkets in Indonesia increased by more than 60 percent, and sales from western-style fast food restaurants more than doubled.[137] Large international firms face significant reputational risk if food safety systems fail, but little hard evidence indicates how well those systems ensure food safety overall.

Another way of looking at the quality of a country's domestic food systems is to look at how well its exported food products comply with import standards. Data on rejection rates for Indonesian exports to the USA and EU suggest that rejection rates are average for most products, with the exception of fish products imported into the EU (Table 14). Neighboring Malaysia did better than Indonesia, as did Chile, where food exporters have implemented strict safety standards.

Lessons for OIC countries

Indonesia clearly demonstrates that it is possible to provide the infrastructure to connect millions of farmers—even extremely geographically dispersed and small-scale farmers—to markets. It also demonstrates that education can reach remote rural communities, enabling a population that was overwhelmingly rural until very recently to achieve high rates of education. Indonesia has also taken steps to strengthen the institutions that

[137] Frazão, Meade, and Regmi (2008).

safeguard the country's valuable natural resource endowments and help businesses prosper. The credit system—a mix of formal, informal, and non-profit groups—has made credit more readily available in Indonesia than in many peer countries.

Indonesia's experience with oil palm offers an instructive model for collaboration between smallholders and agribusiness. It shows that contract farming can be leveraged to supply credit and technical information. At the same time, lines of communication can be blurred, and results can be less impressive than expected, unless positive steps are taken to inform and empower smallholder growers.

TABLE 14: RELATIVE REJECTION RATES FOR VARIOUS TYPES OF EXPORTS TO MARKETS IN THE EUROPEAN UNION AND UNITED STATES, SELECTED COUNTRIES, 2010

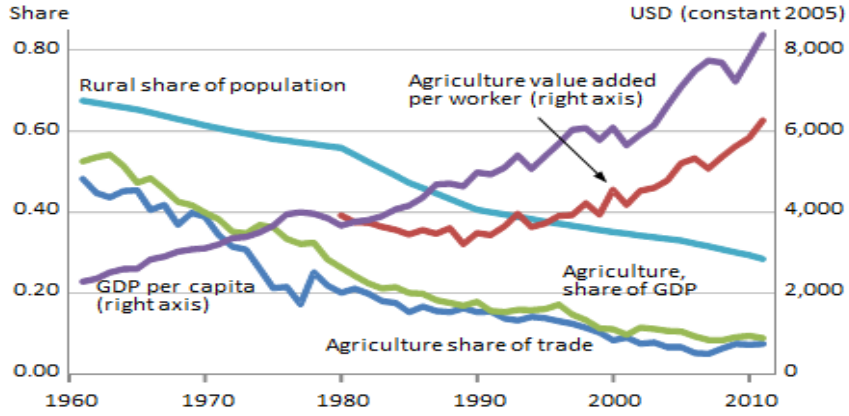
	Total	Fish	Fruit and vegetables	Nuts and seeds	Herbs and spices
EU inspectors					
Indonesia	Medium	High	Low	Low	Low
China	High	Medium	Medium	Medium	Medium
Chile	Low	Medium	Low	Low	Low
Malaysia	Medium	High	Medium	Medium	Medium
US inspectors					
Indonesia	Medium	Medium	Low	Medium	Low
China	Medium	Low	Low	Low	Low
Chile	Low	Low	Low	–	Low
Malaysia	Low	Medium	Low	Medium	Low

Source: UNIDO, NORAD, and IDS 2010.

Turkey

Incomes in Turkey are among the highest of OIC countries. Although a gap remains between average income per worker in agriculture and average national income, incomes in both categories have grown steadily in recent decades (Figure 47). Turkey's rural population is relatively large for a member country of the Organization for Economic Co-operation and Development (OECD), although it has declined steadily, falling from 68 percent in 1961 to less than 30 percent in 2011.

FIGURE 47: STRUCTURAL CHANGE AND THE TURKISH ECONOMY, 1961–2011



Source: World Development Indicators (World Bank 2014h).

Competitiveness and sustainability

A Mediterranean climate and abundant land and water are the foundation of Turkey's strong agricultural sector. The sector also benefits from the country's strategic location next to key markets. Exports to trading partners in Europe and MENA reflect historical advantages rooted in logistics and culture. These multiple advantages, along with income and population growth in some of Turkey's trading partners, have spurred vigorous growth in Turkey's agricultural exports. Fresh fruit and vegetables—high-value products that can best be produced in a narrow set of agroclimatic zones—drive exports to the north, into the rest of Europe. Exports to MENA in the south reflect that region's growing population and demand for value-added food products, as well as its lack of water to grow staple grains. Rising incomes, especially in the wealthier countries of the Arabian Peninsula, also drive exports of high-value products from Turkey.

Table 15 ranks countries in Europe and nearby Central Asia and North Africa by the amount of land available for agriculture and the amount of irrigated land. Turkey ranks first in irrigated area, and fourth in land resources, with over 39 million hectares—significantly behind Russia (which has more than 215 million hectares) and slightly behind Algeria and Ukraine.

TABLE 15: COUNTRIES IN EUROPE, CENTRAL ASIA, NORTH AFRICA, AND THE MIDDLE EAST WITH THE MOST ABUNDANT AGRICULTURAL LAND AND IRRIGATED LAND RESOURCES, 2008

Rank	Country	Agricultural area (million ha)	Country	Area irrigated (million ha)
1	Russian Federation	215.5	Turkey	5.2
2	Algeria	41.3	Russian Federation	4.3
3	Ukraine	41.3	Spain	3.3
4	Turkey	39.2	Italy	2.7
5	Morocco	30.0	Ukraine	2.2
6	France	29.3	France	1.5
7	Spain	27.9	Azerbaijan	1.4
8	Yemen	23.5	Greece	1.4
9	United Kingdom	17.6	Syria	1.3
10	Germany	16.9	Morocco	1.3
11	Poland	16.2	Portugal	0.4
12	Libya	15.6	Tunisia	0.4
13	Italy	14.2	Romania	0.3
14	Syria	13.9	Denmark	0.3
15	Romania	13.5	Moldova	0.2
16	Tunisia	9.8	Netherlands	0.2
17	Iraq	9.2	Albania	0.2
18	Belarus	8.9	Armenia	0.2
19	Greece	7.0	Israel	0.2
20	Hungary	5.8	Georgia	0.1

Source: FAOSTAT (FAO 2013).
Note: Arable land includes area under annual and perennial crops, permanent and temporary meadows and pastures, gardens, and temporarily fallow land. See FAO for a more precise definition of these categories.

In absolute terms, compared to some neighboring countries with warm climates, Turkey ranks first in renewable freshwater resources, with 227 billion cubic meters available in an average year (Table 16). Water availability is similar in France and Italy in absolute terms and also on a per capita basis. Per capita availability is significantly higher in Georgia and to a lesser extent Greece, but those countries have less agricultural land. Georgia's climate is not as mild as Turkey's, which limits production of some products. Worsening water constraints and growing populations in MENA suggest that the region's food imports are likely to grow.

TABLE 16: RENEWABLE INTERNAL FRESHWATER RESOURCES FOR SELECTED COUNTRIES IN EUROPE, NORTH AFRICA, AND THE MIDDLE EAST

Country	Cubic meters per capita	Billion cubic meters
Turkey	3,083	227.0
France	3,056	200.0
Italy	3,003	182.5
Spain	2,405	111.2
Georgia	12,958	58.1
Greece	5,131	58.0
Morocco	899	29.0
Uzbekistan	557	16.3
Algeria	313	11.3
Tunisia	393	4.2
Saudi Arabia	85	2.4
Jordan	110	0.7
Qatar	30	0.1

Source: FAOSTAT (FAO 2013).

Governance and institutions

DOMESTIC AGRICULTURAL POLICIES

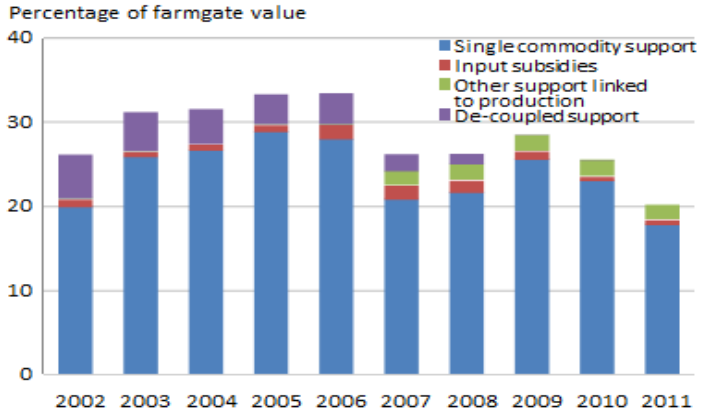
In the past, Turkish agricultural policy was characterized by set commodity prices, supported through government purchases and sales. The government heavily subsidized farm inputs, including credit, while investing considerably in irrigation and other infrastructure. The institutions administering this complex set of instruments included State Economic Enterprises, Agricultural Sales Cooperative Unions (ASCUs), and state-owned banks. A 2011 report by the OECD concluded that "financial losses due to intervention purchasing by ASCUs, the Turkish Grain Board, the state-owned Tobacco Enterprise and the state-owned Sugar Enterprise, coupled with borrowing by the State Economic Enterprises from commercial banks at relatively high interest rates, were key factors in the country's overall economic turbulence in the 1980s and 1990s."[138]

Its policy objectives have changed little, but Turkey started to rely more heavily on markets to implement those objectives in 2001 through the Agricultural Reform Implementation Project. Under that project from 2001 to 2008, Turkey restructured state-owned enterprises and ASCUs and abolished the practice of administering commodity prices. To ease the transition and prepare for EU accession, the government established a National Farmers' Registry System that allowed farming households to receive direct income support that was de-coupled from production. The rationale for that policy change was to allow farmers to respond to price signals when deciding what to produce, while continuing to provide a level of income support similar to that received under the system of commodity price supports.

[138] OECD (2011b:10).

Figure 48 summarizes the support given to farmers by type of policy instrument. The units in the figure, known as Percentage Producer Support Estimates (percentage PSEs), are based on an OECD methodology that combines various types of interventions into an estimated average value for producers, relative to the farm-gate value (inclusive of support) of what they produce. The figure shows that Turkey's farmers receive most of their support in the form of higher prices, in particular through the protection provided by import tariffs and export subsidies and, to a lesser extent, premium payments for particular crops. As a result, farmers must produce particular products to receive support, and if they switch from one crop to another, the relative support given to those crops will affect that choice. Since the supports result in greater output levels, they may lead to the use of marginal land and water resources or perpetuate outdated production methods. The de-coupled payments, which do not affect choices about what to produce or how to produce it, have never formed a large portion of the support provided to farmers and have dwindled since 2006. Targeted assistance programs that generate positive environmental benefits or reduce the impediments to adopting new technology were introduced recently, but they are not central policy instruments. Even so, because of rising world prices and policy changes, the average ratio of producer prices to border prices in Turkey fell from 1.25 in 1995–97 to 1.19 in 2009–11.[139]

FIGURE 48: PRODUCER SUPPORT BY TYPE, TURKEY, 2002–11



Source: OECD 2012.

THE CUSTOMS UNION

Turkey's deep, longstanding ties to the EU have shaped the agricultural sector in important ways. Turkey was an original member of the Council of Europe, established in 1949 to promote European cooperation on human rights, rule of law, culture, and legal standards. In 1959, two years after the European Economic Community (EEC)—the originating common market pillar of the EU—was founded under the Treaty of Rome, Turkey applied for Associate Membership. The scope of the planned economic integration

[139] OECD (2012).

was especially deep, resulting in the Ankara Agreement, also known as the Association Agreement, signed in 1963 and put into effect in December 1964. At the heart of the Agreement was the phased establishment of a Customs Union meant to comprehensively integrate the two economies.

As is often the case, primary agriculture presented many hurdles. The Agreement states that the Association will extend to agriculture, but under special rules (see the next section). Nevertheless, the integration of the other sectors of the two economies moved forward in a substantive way. Under a series of agreements, the European Commission abolished restrictions on imports of most industrial goods from Turkey in 1971, and Turkey implemented two rounds of tariff reductions on EEC goods in 1973 and 1976. To bolster Turkey during an economic crisis, the Council of Association reached an agreement to phase out the customs duties on agricultural products imported into the EEC. After years of stalled progress, plans for the final stage of the Customs Union accelerated in the late 1980s, and implementation of the Union began in 1996. In 1999, Turkey was officially recognized as an EU candidate country, and in 2001 the Association Council adopted an Accession Partnership for Turkey. The Council adopted a Negotiating Framework in 2005. Negotiations began in 2006, nearly 42 years after the Ankara Agreement.

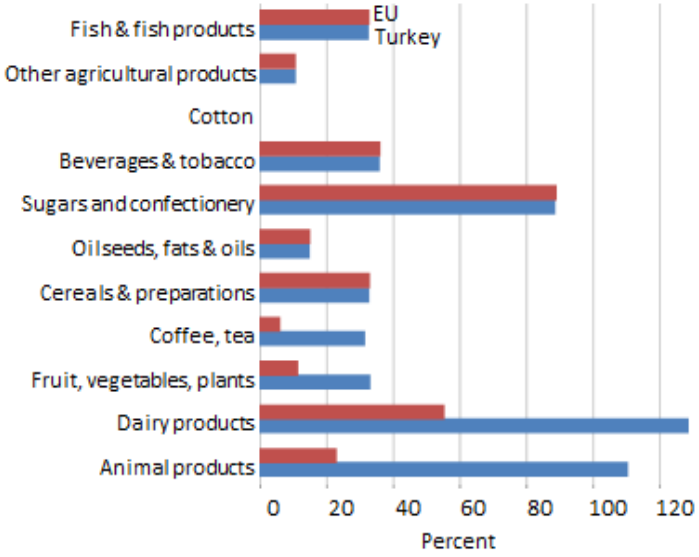
AGRICULTURAL TRADE POLICIES AND THE CUSTOMS UNION

Agriculture remains outside of the Customs Union, yet exclusions have been carved out over time. At the start, the Agreement strictly defined what was meant by primary agriculture, based on definitions in the Treaty of Rome. An important distinction was that most products produced by agribusinesses were treated as manufactured goods. A 1970 Additional Protocol overcame some of the initial hurdles to trade in primary agricultural goods and laid out the expectation that agricultural goods would move freely within 22 years. The Protocol also called on Turkey to align its domestic policies with the EEC's Common Agricultural Policy. Two subsequent Council decisions in 1995 and 1998 further reduced the distinction between primary agriculture and other traded goods. Limits were place on technical barriers to trade, including trade in foodstuffs, and an additional round of tariff reductions was launched.

The decades-long process of lowering barriers to agricultural trade has brought about a de facto free trade agreement between the EU and Turkey for most agricultural goods. Processed food items fall within the Customs Union, and the remaining barriers to primary agricultural goods have been hollowed out by tariff reductions and special exceptions. The OECD recently concluded that about 70 percent of Turkish exports to the EU enter duty free.[140] In addition, Turkey is required to align its third-party tariffs to those reached under free trade agreements struck by the EU.

[140] OECD (2012).

FIGURE 49: SIMPLE AVERAGE APPLIED MOST FAVORED NATION DUTIES FOR TURKEY AND THE EUROPEAN UNION, 2011



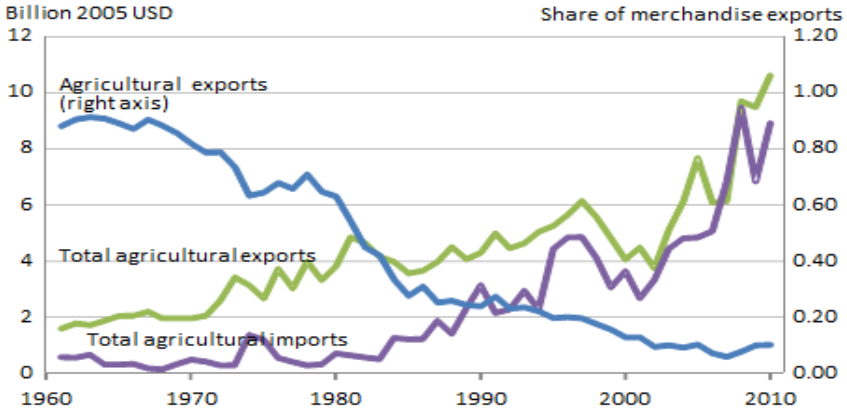
Source: World Tariff Profiles 2012 (WTO 2012).

Because of the Customs Union, Turkey's average applied tariffs for non-agricultural goods are equivalent to those of the EU. Primary agriculture remains outside of the Customs Union, yet the EU and Turkey have largely identical tariff profiles for agriculture as well (Figure 49), although tariff protection accounts for a larger share of protection in Turkey than in the EU. Broadly speaking, the apparent differences in trade policies are largely due to differences in applied rates for the horticulture, dairy, and livestock subsectors. More specifically, tariff rates were much higher on average for dairy and animal products in Turkey than in the EU. Smaller differences occur for horticultural goods, which both Turkey and the EU produce. Finally, in contrast to the EU, Turkey has a significant tea sector, which receives protection from imports.[141]

[141] Turkey produced just under 5 percent of world production in 2011.

Demand and market size

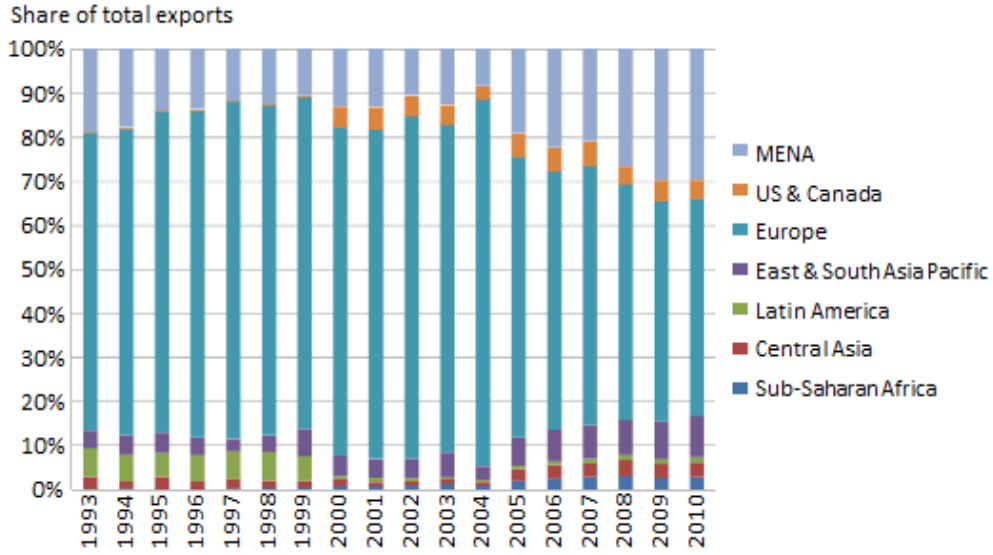
FIGURE 50: AGRICULTURAL EXPORTS AND IMPORTS, AND AGRICULTURAL EXPORTS AS A SHARE OF MERCHANDISE EXPORTS, TURKEY, 1961–2010



Source: FAOSTAT (FAO 2014).

The role of agricultural trade relative to overall trade reflects the same type of structural change affecting the economy at large. Agricultural trade is expanding even as it becomes a smaller part of trade overall (Figure 50). Europe and MENA are the two centers of gravity for Turkey's agricultural trade. Consistent with the fact that most large agricultural importers are in Europe, that region remains the single most important destination for Turkey's agricultural exports, receiving about 49 percent of those exports in 2010. Exports to most other regions have grown modestly in recent years but still constitute a small share of exports by value. Exports to MENA, which have surged in the past five years, are an exception. MENA received nearly 30 percent of Turkey's agricultural exports in 2010. Figure 51 clearly demonstrates MENA's growing importance as a destination for Turkish exports.

FIGURE 51: COMPOSITION OF TURKISH EXPORTS BY DESTINATION REGION, 1993–2010



Source: Authors' calculations and FAOSTAT (FAO 2014).

The role of agribusiness exports

Thus far the discussion has focused on primary agricultural products, but another aspect of structural change is the emerging importance of agro-industry as an economy grows. Agricultural goods are a key input for these businesses, and these businesses add value to those goods in various forms. For highly processed goods, value is added through the manufacturing process and the addition of other inputs. For fresh fruit and vegetables, value is added in the form of quality and food safety assurances as well as prompt, reliable delivery.

As discussed, many goods produced by agribusinesses in Turkey had full access to the EU market, owing to the very early decision under the Association Agreement to treat processed agricultural goods as manufactured goods. Other provisions of the Customs Union facilitated investments between the two economies. In addition, the Cost of Doing Business Survey ranks Turkey high among OIEC member countries, suggesting a supportive business environment. (Recall Table 13). Table 17 reports recent data on FDI in the food, beverage, and tobacco industries. In 2012, companies outside of Turkey invested over US$ 2 billion in Turkey's agribusiness sector. Only Brazil attracted more investors.

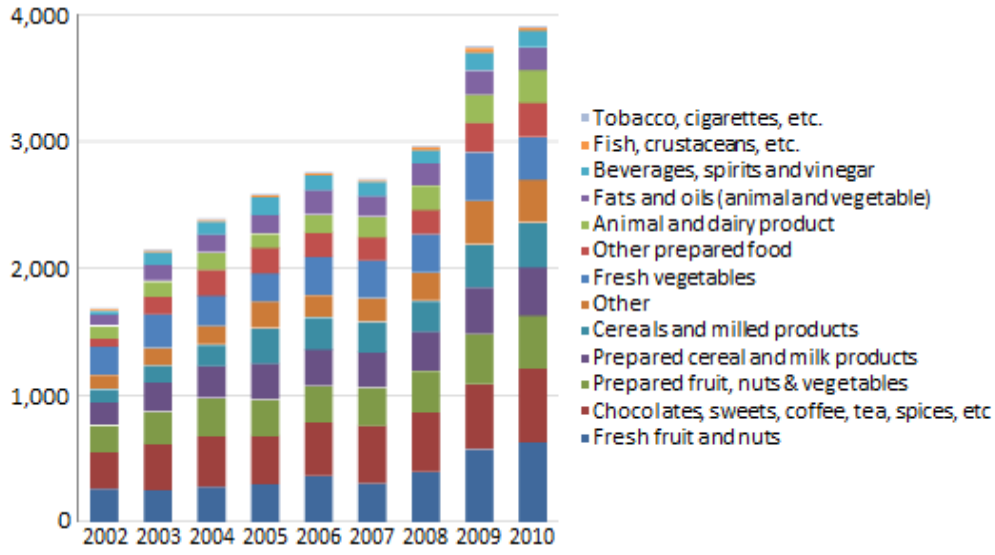
TABLE 17: FOREIGN DIRECT INVESTMENT IN FOOD, BEVERAGE, AND TOBACCO INDUSTRIES, TURKEY AND SELECTED COUNTRIES

Rank	Country	FDI (US$ millions)	Reporting year	FDI stock (US$ millions)	Reporting year
1	Brazil	5,443	2010	82,162	2010
2	Turkey	2,137	2012	7,759	2011
3	Argentina	991	2011	5,259	2011
4	Russian Federation	602	2010	6,323	2010
5	Ireland	553	2012	5,563	2012
6	Mexico	470	2012		
7	Chile	448	2012	2,960	2012
8	Kazakhstan	288	2012	779	2012
9	Thailand	220	2011	5,928	2012

Source: ITC 2014.

Exports of the kinds of basic agricultural goods that are not included in the Customs Union have been growing rapidly, as noted.
Figure 52 is based on a survey of agribusinesses that export both basic agricultural goods as well as the processed agricultural goods that are part of the Customs Union. The number of such firms exporting to MENA has grown along with the volume of exports. A large portion of those firms export either fresh fruit and vegetables or related processed goods.

FIGURE 52: NUMBER OF FIRMS EXPORTING FROM TURKEY TO THE MIDDLE EAST AND NORTH AFRICA, BY PRODUCT TYPE AND YEAR, 2002–10

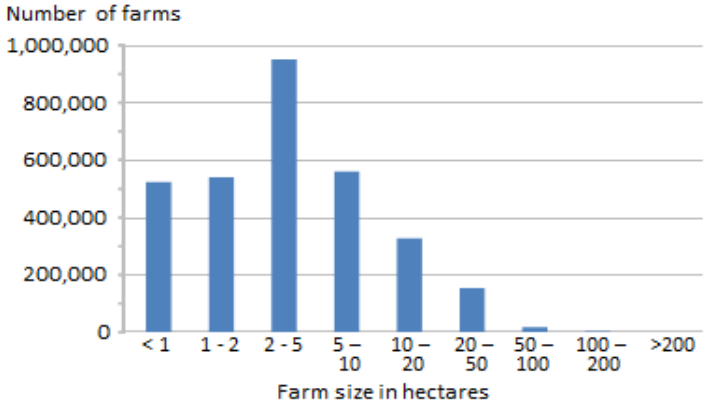


Source: Authors' calculations, based on data from TurkStat (2012).

Markets: The challenge of including all farmers

As the value chain leading from the farm to domestic or foreign consumers becomes more formal and participation by supermarkets and restaurants grows, the risk that poorer and smaller-scale producers will be unable to participate increases. This risk is an ever-present danger in Turkey, given that nearly two-thirds of the country's 3 million farms are smaller than 5 hectares (Figure 53).

FIGURE 53: FARM SIZE DISTRIBUTION IN TURKEY, 2001

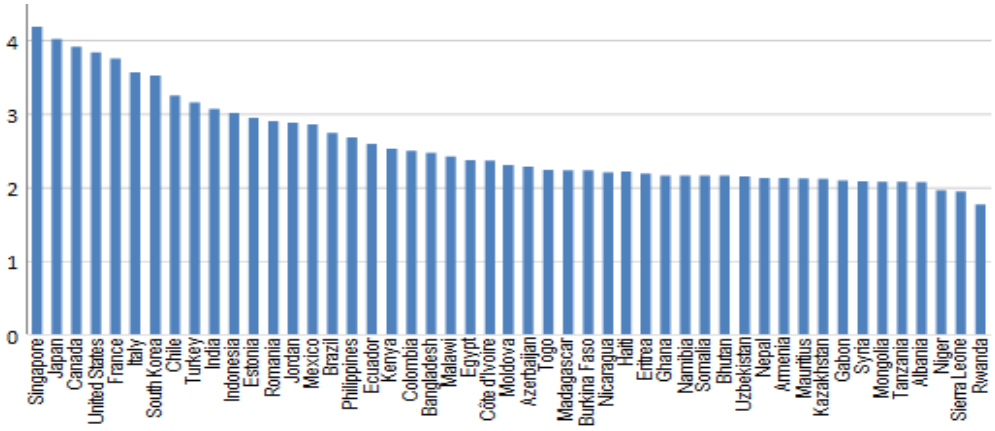


Source: Lowder, Skoet, and Singh 2014.

To link rural communities to markets, Turkey invested heavily in roads, ports, and the regulatory and permitting processes associated with exports. Turkey's membership in the

Customs Union enables most goods to circulate freely. The net result is an efficient logistical network for goods produced or sold in Turkey. According to the World Bank's Logistics Performance Index, which measures the overall efficiency of moving goods into and within a country, Turkey ranks highly, slightly below Chile and ahead of South Korea (Figure 54).

FIGURE 54: LOGISTICS PERFORMANCE INDEX, SELECTED COUNTRIES, 2014



Source: Logistics Performance Index (World Bank 2014e).

Food safety

A distinguishing feature of advanced food value chains is their food safety and food hazard control systems. As a greater share of food is purchased through supermarkets and fast-food restaurants, those businesses carry substantial reputational risk arising from food-borne illness. Governments often promulgate regulations to ensure that domestic food supplies are safe, but in some cases, firms will stipulate even more rigorous hazard control measures in the contracts they strike with suppliers.

In recent years, Turkey has tightened quality and safety rules governing the agricultural sector and food industry. The Production, Consumption, and Inspection of Food Law, implemented in 2004, is the umbrella legislation designed to protect public health and lay out standards for the food industry. Another key piece of legislation is Turkey's 2006 Food Law (No. 5996), which requires all food processing firms to conform to EU food safety standards over time. In large part, these laws and related legislation on animal health and field practices were intended to bring domestic food supply chains into compliance with prevailing EU standards in anticipation of Turkey's EU accession.

Because strong food safety protocols are increasingly recognized as mechanisms for removing legal barriers to some trade destinations and creating a competitive advantage, government has a variety of roles to play with respect to food safety and quality. First, it is government's clear responsibility to establish and enforce minimum standards that protect domestic consumers and to enforce standards agreed upon in trade treaties.

Because the food industry in Turkey is largely populated by small and medium-size firms, another role for government is to help educate the industry about new standards and coordinate efforts to help firms comply. Finally, government can also play a facilitating role by helping the food industry respond to emerging private standards.

Turkey's livestock subsector has received particular attention. The general view is that improving food safety in the livestock subsector could benefit local consumers and open export opportunities, and the government has taken significant actions in this direction. For example, it introduced an identification system for bovine diseases in 2004 and a similar system for sheep and goats in 2009. The Veterinary Services, Phytosanitary, Food and Feed Law, enacted in 2010, brings the regulatory framework for the livestock subsector into closer alignment with that of the EU. These efforts were supported by the EU's Instrument for Pre-accession Assistance Rural Development program for Turkey, which was approved by both parties in December 2007. A needs assessment in preparation for a World Bank project has identified actions that would further strengthen food safety (Box 2).

The Government of Turkey has laid out its plan for policy alignment in the Rural Development Program for 2007–13. The program targets key subsectors, including dairy, meat, fruit, vegetables, and fish, and it has a total budget of € 1.165 billion. The current plan is for the EU to fund half of the program, with the remaining half funded by the Government of Turkey and program beneficiaries in equal measure. Of the total budget, roughly 68 percent will go to helping farmers (40 percent) and food processors (28 percent) conform to EU standards.

BOX 2: ELIMINATING FOOD SAFETY HAZARDS IN TURKEY'S LIVESTOCK SUBSECTOR AND CLOSING GAPS IN COMPLIANCE WITH EUROPEAN UNION FOOD SAFETY STANDARDS

In preparation for a World Bank project, a needs assessment looked at practices in milk collection and milk processing; slaughterhouse and meat processing; production of an animal by-product (rendering); egg collection, processing, and packaging; and fishing vessels, fish wholesale markets, and fish processors. It identified shortcomings that leave the food processing chain vulnerable to food safety hazards and to gaps in compliance with EU food safety requirements. The assessment concludes that the Government of Turkey has a central role in providing a regulatory framework that builds on the new Food Law and includes the adoption of additional best-practice regulations. The assessment suggests public-private partnerships to help small firms plan and secure financing to upgrade their facilities; to upgrade and expand food safety laboratories; to help develop a safe and secure supply base for industry (for example, by preventing and controlling animal diseases, especially foot-and-mouth, bovine tuberculosis, and cattle, sheep, and goat brucellosis); and to enhance market development and access, primarily through the development and dissemination of important information.

Source: World Bank 2012e.

Lessons for OIC member countries

Turkey exemplifies the ways in which comparative advantage and trade can reshape the agricultural sector, even as urbanization and the growth of non-agricultural sectors transform domestic markets. Recognizing the advantages conferred by Turkey's

Mediterranean climate, abundant land and water supplies, and strategic location, the government decided to depend more on markets and less on public marketing agencies. This policy decision set the stage for a significant expansion in agribusiness and value-added exports, especially of horticultural goods.

The case of Turkey also shows how the rise of agribusinesses, supermarkets, and restaurants induces quality and safety to become intrinsic traits of the food that farmers produce. Governments have a leadership role in guaranteeing food safety, although increasingly the demands of private buyers exceed the strictest public standards. For agribusiness, an overall business environment that promotes FDI can help domestic suppliers adapt to changing standards and demands, since overseas partners can bring expertise and established marketing channels along with capital. The risk is that smaller firms and farms may lack the capital or knowledge to meet new standards. Here governments can play a vital role by aggressively reaching out to producers and intermediaries. Though structural adjustment often brings growth to the agricultural sector, it can place the livelihoods of some households at risk, so governments must also make sure that social safety nets are adequate.

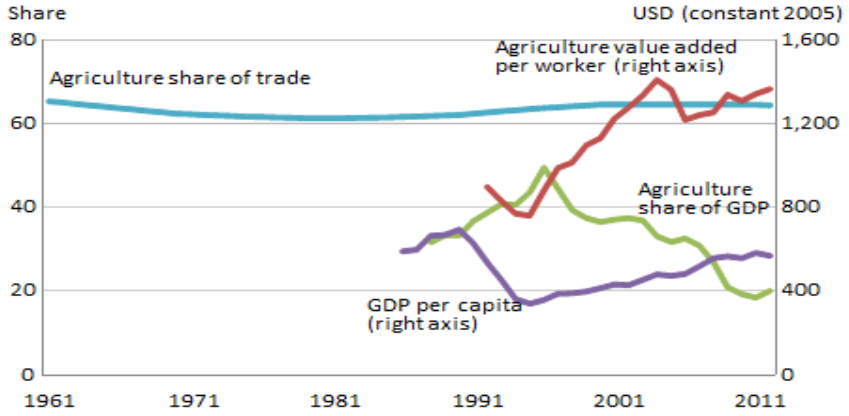
Kyrgyz Republic

Kyrgyz Republic is a small, mountainous, landlocked country, with a territory of 198,000 square kilometers that borders China, Kazakhstan, Uzbekistan, and Tajikistan. Two-thirds of its approximately 5.6 million people live in rural areas. Kyrgyz Republic is also a low-income country. Per capita GNI was US$ 920 in 2011; in 2012, approximately 38 percent of the population lived below the national absolute poverty line and 4.4 percent below the extreme poverty line.[142] Absolute poverty rates are similar in rural (40 percent) and urban (35 percent) areas. Food insecurity was high from 2006 to 2009, although the incidence of food insecurity declined substantially between 2011 (46 percent) and September 2013 (14 percent).[143] Food insecurity is more prevalent in rural households, particularly in the southern provinces. Most food-insecure households rely on a single income, have small garden plots (averaging 0.16 hectares), and raise limited numbers of livestock.

The agricultural sector's contribution to GDP increased from 33 percent in 1990 to 47 percent in 1996 but has gradually declined since (Figure 55). Agriculture currently accounts for 18 percent of GDP, employs around 31 percent of the workforce, and generates about 13 percent of export earnings. It remains central to food security and rural livelihoods. In 2012, agricultural output was valued at KGS 304 billion, of which 50 percent was generated by crop production, 48 percent by animal production, and 2 percent by agricultural services. Within the crops subsector, cereal grains accounted for 31 percent of the value of production, vegetables about 20 percent, potatoes about 16 percent, and fruit for about 13 percent. Within the animal production subsector, cattle and poultry production represented 66 percent of output value, and dairy accounted for about 30 percent.

[142] World Bank (2014d).
[143] WFP (2012, 2013).

FIGURE 55: STRUCTURAL CHANGE AND THE KYRGYZ REPUBLIC ECONOMY, 1985–2011



Source: World Development Indicators (World Bank 2014h).

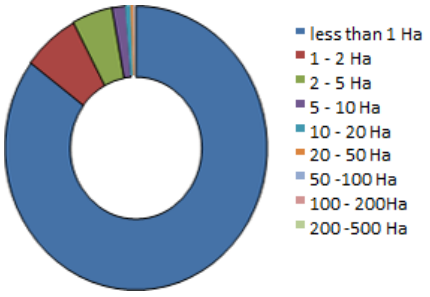
Kyrgyz agriculture is driven by smallholder farmers that are relatively new to farming. Following the collapse of Soviet Union, agricultural land was transferred to private ownership in three phases. First, in 1991–93 legal ownership changed from state property to private ownership. Second, between 1994 and 2004, 75 percent of the country's 1.2 million hectares of arable land was shifted from corporate to individual holdings,[144] and the moratorium on sales of agricultural land was lifted. Third, since 2004 the physical land transfer has been finalized. New individually held farms have received support, and enabling market conditions have been created.

Seventy-eight percent of arable land (940,000 hectares) went to private (peasant) farms. Farm size ranges from 0.2 hectares to 2.9 hectares; 96 percent of private farms are smaller than 2 hectares (Figure 56). Most of the national livestock herd is owned by family-based private farms. Household farms (garden plots) occupy around 96,700 hectares (8 percent of agricultural land); the average size of a household farm is 0.10 hectares. In addition, some 172,300 hectares of agricultural land (14 percent) are farmed by agricultural enterprises that include state and collective farms. About 75 percent of the country's arable land is irrigated.

[144] The remaining areas were kept in the Land Distribution Fund.

Operating private peasant farms and household farms, smallholders generate about 98 percent of agricultural output. They produce 98 percent of fruit and vegetables, 97 percent of grains, and 95 percent of potatoes and cotton. Smallholder farming can be described as semi-subsistence: Households consume the crops they grow and sell small amounts of produce on the market.

FIGURE 56: FARM SIZE DISTRIBUTION IN KYRGYZ REPUBLIC, 2002



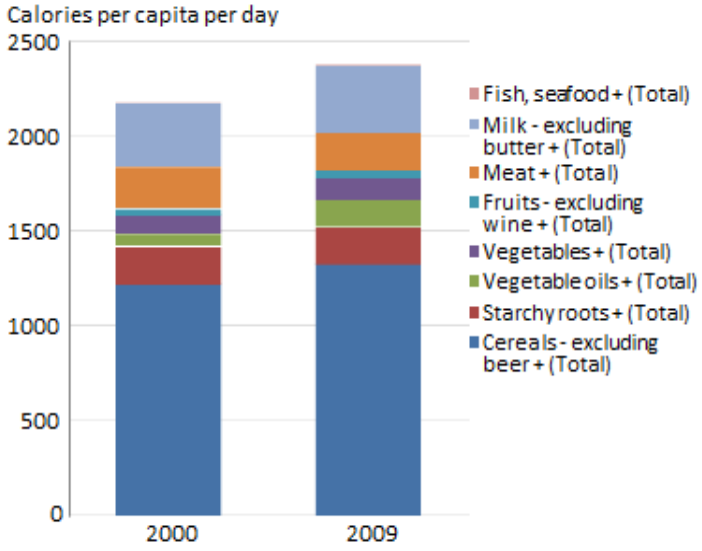
Source: Lowder, Skoet and Singh, 2014.

Kyrgyz Republic is geographically, climatically, and culturally divided into northern and southern regions. The three southern *oblasts* (provinces) (Batken, Jalalabad, and Osh) have a distinct regional identity vis-à-vis the northern provinces (Chui, Issyk Kul, Naryn, and Talas). The southern region is more oriented to crop production, has smaller farms (0.4 hectares), and the climate favors the production of fruit, vegetables, cotton, and rice. The northern region is oriented more toward livestock production. Farms are larger (above 1.0 hectare), and the climate favors the production of grains, fodder crops, and potatoes. Major export outlets are located in Osh City (southern region) and Bishkek City (northern region).

Demand and market size

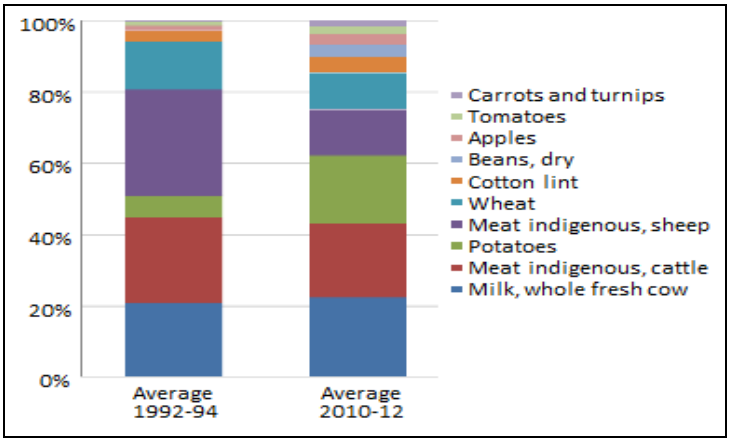
Average daily per capita calorie consumption in Kyrgyz Republic increased by 16 percent between 2000 and 2009, mostly because of increased consumption of cereals and vegetable oils (Figure 57). Over the same period, meat consumption declined by about 10 percent, but at 197 kilocalories per capita per day on average, it is higher than meat consumption in the eight other OIC member countries studied here. Milk, meat, and potatoes are the most important commodities in terms of farm revenue (Figure 58).

FIGURE 57: DAILY PER CAPITA CONSUMPTION OF CALORIES IN KYRGYZ REPUBLIC, 2000–09



Source: FAOSTAT (FAO 2014).

FIGURE 58: TOP SOURCES OF FARM REVENUE IN KYRGYZ REPUBLIC, 1990–92 AND 2010–12



Source: FAOSTAT (FAO 2014).

Statistics on the top sources of farm revenue in 1990–92 and 2010–12 show how the composition of agricultural production in Kyrgyz Republic has changed (Table 18). The livestock subsector remains important, with milk and meat being the major commodities, whereas production of potatoes, beans, and a number of other horticultural products, including carrots, tomatoes, and apples, has increased.

TABLE 18: GROSS PRODUCTION VALUE IN KYRGYZ REPUBLIC (CONSTANT 2004–06 US$ MILLIONS)

Item	Average (1990–92)	Average (2010–12)
Milk, whole fresh cow	154	222
Meat indigenous, cattle	179	205
Potatoes	46	191
Meat indigenous, sheep	222	127
Wheat	101	102
Cotton lint	23	45
Beans, dry	1*	35
Apples	10	29
Tomatoes	8	22
Carrots and turnips	2	15

Source: FAOSTAT (FAO 2014).
Note: * denotes that data were not available for all years.

The composition of agricultural trade has also undergone substantial change (Table 19). The main imports include wheat, chocolate, sugar, and chicken. Wheat imports more than halved in real terms between 2009/11 and 1992/94. On the export side, beans overtook tobacco to become the largest export, and the country has also started exporting small amounts of milk, other dairy products, potatoes, and carrots.

TABLE 19: KYRGYZ REPUBLIC'S TOP IMPORTS AND EXPORTS BY VALUE (2005 US$ THOUSANDS)

Imports	Average (1992–94)	Average (2009–11)	Exports	Average (1992–94)	Average (2009–11)
Wheat	123,264	57,989	Beans, dry	n/a	35,493
Chocolate products nes	323*	52,148	Cotton lint	12,570	24,231
Sugar, refined	53,295	51,103	Tobacco, unmanufactured	23,587*	14,603
Meat, chicken	n/a	42,727	Milk, whole fresh cow	n/a	9,249
Oil, sunflower	4,294	34,463	Potatoes	n/a	8,728
Cigarettes	802*	28,756	Carrots and turnips	n/a	5,851
Flour, wheat	37*	27,507	Onions, dry	4,981*	5,602
Beverages, non-alcoholic	392*	20,134	Beverages, non-alcoholic	n/a	4,944
Food prep nes	n/a	18,262	Cheese, whole cow milk	n/a	4,902
Pastry	5,772	17,208	Milk, skimmed dried	n/a	3,642
Beer of barley	417	15,250	Butter, cow milk	n/a	2,847
Sugar confectionery	553	14,159	Meat, sheep	n/a	1,765

Source: Authors' calculations, based on FAOSTAT (FAO 2014) and World Development Indicators (World Bank 2014h).
Note: * denotes that data were not available for all years.

Smallholders' participation in the main crop markets

WHEAT

Wheat is a major staple in Kyrgyz Republic. The crop is not profitable—it is grown purely for food security on 28 percent of arable land (325,000 hectares), largely (96 percent) by smallholder farmers.[145] The quality of local wheat is low, because soils are unsuitable for growing the harder wheat varieties with higher gluten content that are favored for processing. Locally produced wheat meets 70 percent of domestic demand; the remainder is met by wheat imported from Kazakhstan and Russia. In 2009, in response to food price increases and wheat export bans in Russia and Kazakhstan, local wheat production increased sharply from the annual average of 0.7 million tons to 1.1 million tons. Starting from 2010, as wheat prices fell, wheat production returned to its pre-2009 level.

The 2008 food crisis prompted steps by the government to address food insecurity, including price and trade interventions. The government set a price ceiling for major staple foods such as wheat, wheat flour, potatoes, sunflower seed, and sunflower oil; limited the profit margins of output traders; restricted fuel prices; and adopted new regulations on food imports and exports. These interventions were on a small scale and did not seriously affect wheat prices and production. The government is now considering closing the agency mandated to implement the interventions.

Farm households use approximately 40 percent of wheat production for food and seed; the remainder is marketed domestically. Due to limited storage capacity throughout the country, wheat is sold during the harvest season to traders, who transport it to larger markets for immediate resale or sale during the winter, when traders can command premium prices, and to processors. The limited number of local wheat mills use outdated, semi-mechanized equipment. High processing losses, in addition to high transportation and processing costs, result in high prices for locally produced wheat flour.[146]

Low productivity and high production costs are major issues for wheat. Yields—declining since 2007—dropped to 1.7 tons per hectare in 2012. Wheat productivity is low for several reasons. Farmers use little fertilizer or quality seed; in the 2010 winter wheat crop, for instance, actual seed use was only 64 percent, and the average fertilizer application was 78 kilograms per hectare.[147] High prices and costly and inefficient distribution channels for fertilizer explain its low use.[148] Agricultural equipment is in poor condition and, because of severe shortages, frequently unavailable at the right time for crop operations. Kyrgyz Republic has the lowest level of agricultural mechanization in ECA; the machinery shortage in 2009 was 45 percent for combine harvesters and 30 percent for seeders. Limited access to agricultural machinery leads to suboptimal land preparation, seeding, and harvesting, and is estimated to cause losses that are 15–25 percent higher than normal losses of 12 percent. Aside from leading to production and

[145] IFDC (2003).
[146] IFDC (2003).
[147] FAO and WFP (2010).
[148] FAO and WFP (2010).

harvesting losses, the machinery deficit raises land preparation and harvesting costs, which are 55 percent higher in Kyrgyz Republic than in Kazakhstan.[149]

Substantial post-harvest losses result from the limited availability or absence of storage facilities. The country's 2,043 warehouses have a capacity of 350,400 square meters, but 71 percent of this capacity is in the capital city (Bishkek), and another 9 percent is in Osh City.[150] Worse, the facilities are outdated, making potential users reluctant to store produce there. Rising and more competitive wheat production in Russia and Kazakhstan will keep wheat prices low into the foreseeable future. If domestic wheat production is to compete with imported wheat, farmers' poor access to inputs, agricultural machinery, and adequate storage facilities must be addressed.

POTATOES

Potatoes are the country's second most important staple food crop and an export crop as well. Smallholders account for 99 percent of potato production (1.4 million tons annually on about 82,000 hectares, equivalent to 7 percent of arable land). Seventy-five percent of production comes from the northern region. Around 500,000 tons of potatoes are consumed domestically, and remaining volumes are exported. Kazakhstan is the largest importer of the crop, which is also exported to Uzbekistan, Tajikistan, and Russia. Annual export earnings from potatoes are about US$ 18.5 million (2011).

Potato yields are relatively good, although productivity would improve if more farmers could use better seed and fertilizer, plant and harvest the crop on time, and improve post-harvest handling. At present, as much as 15 percent of the potential yield is lost in the field because labor and machinery are not available when needed during the growing season. After 90–120 days of storage in outdated warehouses that lack refrigeration and suffer from frequent power cuts, around 20 percent of the initial weight of potatoes is lost.[151] For that reason, farmers tend to sell potatoes during the harvest season.

Potatoes are sold primarily to large traders (85 percent). Direct sales to consumers and agribusiness (3 percent) are limited. Supply chains with local supermarkets have not yet developed, although Kazakh and Russian supermarkets have expressed increasing interest in sourcing potatoes directly from farmers.[152] The considerable time and high cost of introducing new technology and reliably collecting, storing, and transporting a sufficient supply of potatoes of the right types and quality make it challenging to conclude such arrangements, however.

A major issue for potato marketing is transport, which is costly and time-consuming owing to customs valuation issues, bureaucratic barriers at border crossings, and corruption. For example, customs inspection regulations in the Kyrgyz Republic and neighboring

[149] FAO and WFP (2010).
[150] World Bank (2011b).
[151] USAID (2011).
[152] Authors' personal communication with Agribusiness Competitiveness Center and AgroLead.

Kazakhstan and Tajikistan require the entire truck to be unloaded; traders resort to informal payments to circumvent these regulations and reduce delays.[153]

Farmers, believing that traders keep farm-gate prices low to increase their profit margins, are reluctant to enter into longer-term contractual agreements with traders, who then cannot sign contracts with larger potato importers. Lower marketing costs, combined with better access to reliable information in domestic and foreign markets, better marketing strategies by farmers, and stronger contract enforcement would help farmers as well as traders to establish a more sustainable potato supply chain.

FRUIT AND VEGETABLES

Vegetables—including onions, carrots, tomatoes, and cucumbers—are major cash and export crops produced entirely by smallholders; about half of production comes from household farms (gardens). Vegetable production and exports have increased steadily since 2007. In 2012, around 1.3 million tons of vegetables were produced. About 66 percent of that production is sold, largely in domestic markets (63 percent), to traders (80 percent), agribusiness (10 percent), and other consumers.[154] About 37 percent of marketed production is exported to Kazakhstan, Russia, Turkey, and China through traders (80 percent) and foreign trading companies (less than 1 percent). In 2013, vegetable exports earned about US$ 106 million. Processed tomatoes represented 30 percent of fruit and vegetable exports.[155]

Despite being in high demand in domestic and export markets, vegetables are grown on less than 4 percent of arable land. The most frequently cited reasons for limited vegetable production are the lack of finance to invest in production and uncertainty about market prices and demand.[156] To scale up production, smallholders will need better access to credit and reliable market information. Credit institutions are reluctant to lend to agriculture in general and to small farms in particular because of "structural risks associated with their size, asymmetric information, high transaction costs and high business risks."[157] Current collateral requirements are high at around 130 percent.[158]

Increasing safety and quality requirements are another major issue for vegetable farmers and food processors. Farmers have limited knowledge about standards at every stage of the agri-food marketing chain, including standards for soil and water quality, plant protection, farm hygiene, and environmental and social issues.[159] Farmers and processors also lack knowledge of basic harvesting principles such as timely harvesting, removal of vegetables with visible evidence of disease or severe insect damage, and careful handling of perishable produce. The most common and important concern of agribusiness and

[153] World Bank (2011b).
[154] OECD (2014).
[155] OECD (2014).
[156] OECD (2014).
[157] OECD (2014).
[158] World Bank (2014d).
[159] USAID (2011).

exporters is the poor and mixed quality of unprocessed produce.[160] Exporters of processed food must meet the stricter food safety and quality requirements imposed by importers, including supermarkets. Smallholders would benefit from improved knowledge of GlobalGAP Control Points and Compliance Criteria, which have been developed specifically to enable small-scale farmers to meet basic farming standards. Food processors would benefit from obtaining ISO certification.

High losses in transport and storage are costly. Vegetable production is concentrated in the two southern provinces (Jalalabad and Osh, with 45 percent of production) and one northern province (Chui, with 40 percent). Jalalabad and Osh are about 600–800 kilometers from Bishkek, where the main domestic markets and export outlets to Russia and Kazakhstan are based. Perishable vegetables are transported from fields in trucks that lack adequate cooling facilities. Delivery times are long owing to delays at borders and traffic police points.[161] For example, along the major Ak–Jol–Bishkek–Osh–Dostuk trade corridor (765 kilometers), transport costs are US$ 767, including US$ 655 for official and US$ 112 for unofficial payments. Total travel time is 27 hours at an average speed of about 39 kilometers per hour, and trucks are stopped 15 times by transport control and traffic police. Once vegetables arrive at the main markets, their shelf-life is reduced by limited, inadequate storage facilities. Physical losses of vegetables during transport and storage are estimated at 30 percent,[162] and informal payments are estimated to account for about 5 percent of the value of the transported crop.[163]

Farmers' bargaining position is weakened by the lack of reliable market information, small volumes, and inadequate storage facilities. Vegetable producers who participate in the export market by selling to traders report receiving almost the same price as they receive for selling their produce for domestic consumption.[164] Better access to market information, adequate storage facilities, and better marketing strategies (such as sorting and grading produce on the farm and selling in bulk through producer groups) would improve farmers' bargaining positions and help them realize a better price for these high-value crops.

Only around 0.3 percent of vegetable production is transformed into tomato paste, tomato juice, cucumber and tomato pickles, and dried vegetables,[165] yet even for the small volumes they handle, processors find it difficult to secure reliable supplies of good quality produce. Commonly cited difficulties include the geographic dispersal of producers, the poor and varied quality of the produce, and failure to meet the terms of contracts with regard to volumes and prices. Weak supply arrangements and the high cost of sourcing sufficient quantities of produce have caused some processors to import juice concentrates.[166]

[160] USAID (2011).
[161] World Bank (2011a, 2011b); Agribusiness Competitiveness Center (2008).
[162] USAID (2011).
[163] World Bank (2011b).
[164] DIW Berlin (2011).
[165] USAID (2011).
[166] World Bank (2014d).

Despite favorable climatic conditions in the southern region, greenhouse production of vegetables has not developed. Domestic demand for vegetables is met in winter through imports from Uzbekistan, Turkey, and China. Some of the imported winter/spring vegetables are re-exported to Kazakhstan and Russia.[167] Once the Customs Union rules come into effect, prices of imported vegetables from China will rise, creating an opportunity for Kyrgyz farmers to enter this niche market.[168] Greenhouse production will require large investments in technology and skills, however, which smallholder farmers cannot make without access to credit.

Fruit production has nearly doubled since 2007. Apples, apricots, cherries, and watermelons are major cash and export crops produced almost entirely by smallholders. Household farms (gardens) produce around 32 percent of fruit; more than 70 percent of production comes from the southern region. In 2012, the country produced around 410,000 tons of fruit, of which about 72 percent was marketed. About 68 percent of the marketed volume was sold in domestic markets to traders (80 percent) and agribusiness (15 percent); the remainder was sold directly to consumers. Exports (to Kazakhstan, Russia, Turkey, and China) accounted for about 32 percent of marketed volumes and were valued at US$ 43 million in 2013.

The food processing sector consumes around 2 percent of apple and pear production.[169] Apricots grown in the southern region are processed (dried) by farmers. Fresh fruit is sold immediately after harvesting to traders, agribusinesses, and consumers. Post-harvest losses are about 30 percent.

The major concerns in fruit marketing resemble those for vegetables: high marketing costs, trade barriers, the lack of reliable market information, and substandard food safety and quality practices.

COTTON

Cotton, grown in the southern region, is the third most important cash crop; 94 percent of production comes from smallholders. Around 68 percent of cotton is sold in domestic markets, with the remaining 32 percent going mostly to Russia (84 percent) but also to Turkey (15 percent). Cotton is sold to ginneries or traders. Kyrgyz Republic has the highest cotton prices in Central Asia. Most farmers grow cotton under contract farming arrangements, so they face fewer constraints on obtaining good seed and fertilizer. Even so, cotton yields remain low at 2.3 tons per hectare, and production has declined gradually since 2007. Annual export earnings fell from US$ 43 million in 2007 to US$ 19 million in 2013.

[167] Mogilesvkii (2012).
[168] The Eurasian Economic Community Customs Union was established in 2006 by the Republic of Belarus, the Republic of Kazakhstan, and the Russian Federation. The Customs Union is a first step toward creating a potentially vast common market (a single economic space) similar to the European Union among former Soviet states. The Kyrgyz Republic announced its intention of joining the Customs Union in 2011.
[169] USAID (2011).

Cotton production is declining primarily because production costs are rising. To benefit from economies of scale, cotton should be grown on a minimum of 3.0 hectares, but the average Kyrgyz cotton farm is about 0.4 hectares. Little land is available for rent, and when it is, rents are high. Agricultural machinery, including harvesting combines, is scarce and costly, and so is labor, ever since Uzbekistan closed its borders in 2010 and the supply of cheap labor dwindled. For these reasons, more farmers are abandoning cotton to grow maize and rice.

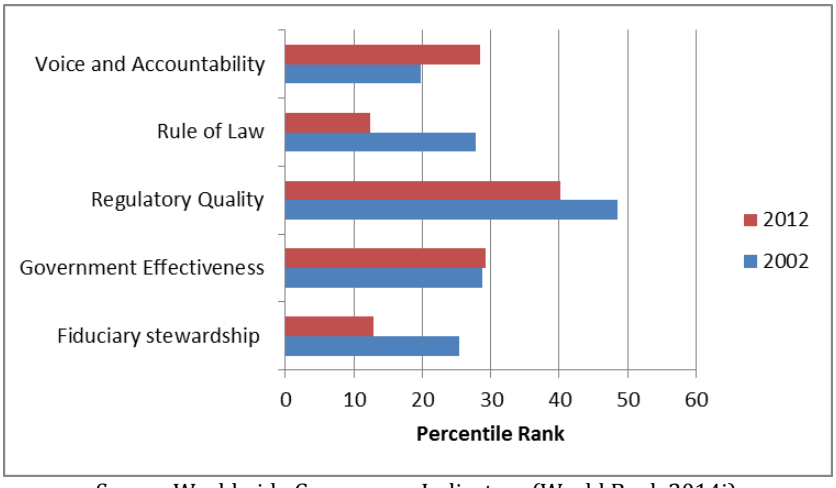
Cross-cutting issues impacting smallholders' access to markets

GOVERNANCE AND INSTITUTIONS

Figure 59 shows changes in five key governance indicators for Kyrgyz Republic between 2002 and 2012.

As the figure shows, Perceptions associated with "Voice and Accountability" improved between 2002 and 2012. However, other indicators have fallen, some considerably.

FIGURE 59: GOVERNANCE INDICATORS FOR KYRGYZ REPUBLIC, 2002 AND 2012



Source: Worldwide Governance Indicators (World Bank 2014i).

Although perceptions of governance have not fared too well, the 2013 Business Environment and Enterprise Performance Survey (BEEPS) finds improvements in the local business climate since 2008, especially for *electricity*; *courts*; *crime, theft, and disorder*; *tax administration;* and *practices of informal economy competitors*. Limited improvements are reported for *tax rates*, *skills and education of labor*, *transport*, and *customs and trade regulations*. Key obstacles to doing business include *concerns about political outcomes, tax rates*, *corruption*, and *skills and education of labor*.

With regard to *regulations and bureaucracy* perceptions on interactions with the government improved, but the quality of public services is reportedly worsening. The

environment for *taxation* improved after reforms in the last five years simplified tax regimes, reduced the number of taxes, and reduced some tax rates. Almost half of the enterprises surveyed report that they must make unofficial payments to public officials and that the incidence of bribery is rising. Most firms—large and (increasingly) even small firms—find that the *skills and education of labor* pose major obstacles for doing business. *Financing* is more easily available, and commercial banks' application processes are simpler, but given the strong growth in credit to the private sector over the survey period, it appears that the financial sector could not adequately support businesses. *Courts* are the least important problem for doing business, although declining use of the court system may indicate declining trust in the system. The quality of physical *infrastructure* is perceived to be improving. Although power outages increased, losses from outages have fallen significantly. In contrast, transport infrastructure remains an issue.

The Cost of Doing Business study[170] reports on a separate set of perceptions about the strength of the institutions the Kyrgyz Republic has put in place to support the business environment. Overall, Nigeria ranks 68th out of 189 countries covered by the surveys. The country does particularly well when respondents are asked about how easy it is to start a business and about difficulties they face acquiring credit. Responses to questions about contract enforcement pull down the overall average.

Despite strong domestic and foreign demand for processed food, the food processing sector has not been able to exploit market opportunities and cannot compete with Russian and Kazakh food imports. The food processing sector's development is limited by political instability, the weak business environment, poor transport and energy infrastructure, a lack of investment, informal barriers to exports, and limited knowledge of new technologies and skills. Constraints on the quantity and quality of produce have slowed the industry's development, along with the challenges involved in meeting a growing array of food safety and quality requirements. Kyrgyz Republic's accession to the Customs Union will create good opportunities for the domestic food processing sector to capture the niche market currently occupied by imports from China, but to do so, processors must address production inefficiencies, meet food safety and quality standards, resolve supply problems, and improve skills along the supply chain. An encouraging sign is that 44 percent of registered food processing enterprises had ISO certification in 2012, compared to 16.2 percent in 2009.

As a WTO member, the country has implemented a regime of low tariffs and free trade, yet trade barriers remain, including bureaucratic barriers, corruption, customs valuation problems, administrative inefficiencies at border crossing points, and informal payments. The Enabling Trade Index and Logistics Performance Index for Kyrgyz Republic in 2009 were low (3.13 and 2.62, respectively). High informal payments seriously limit marketing and reduce farm-gate prices. A 2008 study reports that traders transporting cherries in 19-ton refrigerated trucks from Batken, Kyrgyz Republic to Russia via Kazakhstan made informal payments of US$ 161 within Kyrgyz Republic, US$ 750 while crossing Kazakhstan, and US$ 295 in Russia.[171]

[170] World Bank (2013b).
[171] Agribusiness Competitiveness Center (2008).

Significant domestic barriers to trade, beyond transport costs arising from the distance between two locations, appear to persist. Numerous roadblocks and attempts by local governments to restrict access to local markets and bazaars drive price differences between regions of Kyrgyz Republic to levels that are at least as high as price differences between Central Asian countries.[172] In 2010, for instance, differences in average annual prices between selected northern and southern provinces were 35 percent for apricots, 83 percent for tomatoes, 86 percent for wheat, 110 percent for cabbages, and 113 percent for potatoes. Significant differences in prices for similar commodities were recorded even within regions, including differences of 75 percent for beans, 125 percent for onions, and 175 percent for carrots within the southern region. Differences in wholesale and retail prices for fruit and vegetables within the same market were as large as 80–90 percent.[173] A reliable market information system would go a long way to helping farmers strengthen their bargaining position, develop relationships with buyers based on transparency and trust, diversify production, and increase their production of cash crops.

Access to markets in Iran, Turkey, and Gulf countries will expand if the North–South transportation route becomes operational. That route would enable Kyrgyz and Tajik exports to avoid Uzbek border crossings,[174] which are associated with highly uncertain delivery times and costs. In addition to official fees of US$ 300 per truck, informal payments of US$ 1,000 per truck are expected. Truckers need visas and must pay an escort fee of US$ 1 per kilometer. Given the difficulties involved in crossing Uzbek borders, agricultural exports to Afghanistan, Bahrain, Jordan, and UAE are limited. Kyrgyz Republic currently exports nuts, dried fruit and vegetables, and kidney beans to UAE, Iran, and Turkey. If transportation routes are rehabilitated—the Osh–Batken road (bypassing Uzbek territories) and the Anzob and Shakristan tunnels between Dushanbe and Khudjand—exports can grow and diversify.

Kyrgyz Republic already enjoys preferential access to markets in Kazakhstan and Russia under free trade agreements. Joining the Customs Union would allow cheaper wheat imports from Kazakhstan and Russia. At the same time, it would increase import tariffs for food, vegetables, and fruit from China, which would protect local agriculture and open additional market opportunities. To benefit from such arrangements, however, the country must invest in improving agricultural productivity and processing and reduce marketing costs and other trade barriers.

ACCESS TO FINANCE

Despite the expansion of agricultural finance, lending is highly concentrated in livestock production. Interest rates remain high for several reasons, including insufficient competition among financial institutions, financial institutions' difficulty in accessing deposits and external funding, the high disease and weather risks in agriculture, poor quality of information on prospective borrowers, as well as the limited collateral and high

[172] Grafe, Raiser, and Sakatsume (2005).
[173] World Bank (2011a).
[174] World Bank (2011b).

transaction costs involved in lending to smallholders.[175] Collateral requirements for small loans are high, and the law limits the use of land as collateral.

The government has sought to create an enabling policy environment for financial institutions to lend to agriculture. The key players in rural finance are a commercial agriculture bank (Ayil Bank) with a lending portfolio of KGS 2.5 billion; some 360 microfinance organizations (MFOs) that provide 23 percent of all credit in the financial sector; and 238 credit unions that provide 2.8 percent of credit in the financial sector. Even with these advances, most lending still goes to the livestock subsector. In Ayil Bank's credit portfolio, for instance, 77 percent of credits were provided to cattle breeding and only 10 percent to crop production. Similarly, 93 percent of MFOs' agricultural loans went to the livestock subsector.

At the same time, Kyrgyz Republic still has the lowest bank credit and loan penetration in ECA.[176] A recent study concludes that agricultural finance could expand through efforts to encourage competition among financial institutions, improve their access to deposits and external funds, reduce lending risks (such as disease and weather risks in agriculture, poor information on borrowers, and weaknesses in collateral systems) in order to lower interest rates, and expand financing options, such as warehouse receipts. Specific legal and regulatory measures that need improvement include the Law on Microfinance Organizations (2002) (which prohibits MFOs from setting interest rates and fees independently and freely), the Law on Microfinance (which limits the deposit-taking MFOs to time deposits only, thereby limiting their capacity to offer inexpensive credit);[177] and the Laws on Pledge and Administration of Land for Agricultural Purposes (which prevent the use of agricultural land as collateral). A legal and regulatory framework is needed for warehouse receipt financing, as is a new law on sharing credit information.

Kyrgyz Republic, with the lowest level of mechanization in ECA, must alleviate the severe shortage of agricultural machinery to reduce production costs and losses. Farmers and the private sector do not invest in mechanization owing to high interest rates, a lack of collateral, and low availability of lease financing.

FOOD SAFETY

Kyrgyz Republic is a member of the Codex Alimentarius Commission and a correspondent member of ISO. Human health protection is regulated by the Law on Sanitary-Epidemiological Safety of the Population (2003) and animal health by the Veterinary Law.[178] The Law on Technical Regulations lists products requiring mandatory and voluntary certification. In 2013, the Kyrgyz Center of Accreditation (KCA) became a full member of the International Laboratory Accreditation Cooperation, which allows KCA to apply ISO standards in accrediting domestic laboratories and certification bodies. KCA carries out accreditation of testing laboratories for compliance with ISO/IEC 17025.[179,180]

[175] World Bank (2011a).
[176] World Bank (2011a).
[177] Syminvest (2013) and KyrTag (2014).
[178] World Bank (2011a) and FAO (2011).
[179] World Bank (2013c).

As of 2013, about 46 percent of national standards were fully aligned with international WTO standards. Currently, two state-of-the-art reference laboratories provide reliable and affordable calibration services. Interest in quality certification among food processing enterprises remains comparatively low, however. Local enterprises are focusing more on the immediate need to resolve production inefficiencies than on efforts to improve quality, and on maintaining their domestic market share than on their share of quality-sensitive external markets.[181]

INFRASTRUCTURE

Market infrastructure—roads, storage facilities, and wholesale assembly and post-harvest processing facilities (packing, labeling)—is poor at all levels throughout the country. Every year, 200 kilometers of roads are lost to inadequate maintenance.[182] In 2012, around 92 percent of farmers surveyed by OECD reported having no access to off-farm storage facilities, and 71 percent of those with access to warehouses reported using them for non-agricultural products, perhaps because the facilities are outdated and inadequate for storing fruit and vegetables. The unreliable power supply is reportedly responsible for a 13 percent reduction in the value of annual sales.[183] Adequate market infrastructure would give farmers an incentive to store both perishable and non-perishable products. They would gain an opportunity to increase their incomes and invest in improving the productivity and production of cash crops.

Lessons for other OIC countries

The Kyrgyz Republic case study highlights the challenges of an agricultural sector driven by smallholder farmers who are relatively new to farming, receive little support, and miss out on emerging market opportunities. Smallholder farmers generate about 98 percent of Kyrgyz Republic's agricultural output. For a range of important commodities—wheat, potatoes, vegetables, and cotton—limited access to agricultural machinery causes losses estimated to be 15–25 percent higher than normal losses of 12 percent. The machinery deficit also raises land preparation and harvesting costs, which are 55 percent higher in Kyrgyz Republic than in Kazakhstan. The small number and geographic concentration of obsolete storage facilities result in substantial post-harvest losses. Not surprisingly, despite strong domestic and foreign demand for processed food, constraints on the quantity and quality of produce have slowed development of the processing industry, which cannot exploit market opportunities or compete with imports. Administrative inefficiencies and graft at border crossings (Kyrgyz Republic is a landlocked country) also seriously affect farm-gate prices and the capacity to reach new markets.

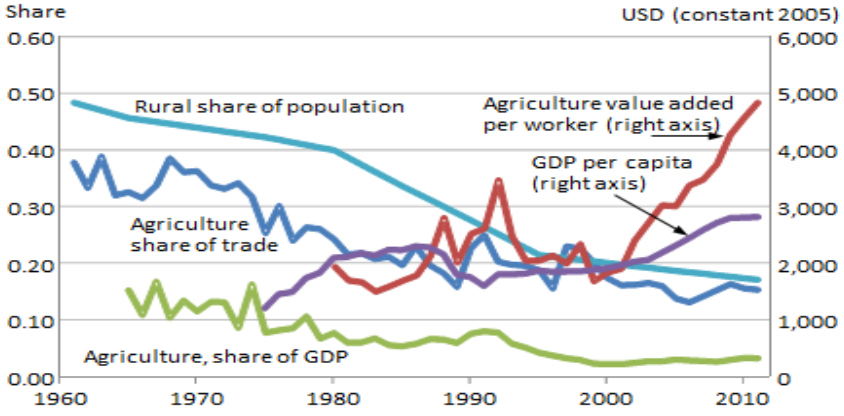
[180] ITC (2013).
[181] World Bank (2013c).
[182] World Bank (2014d).
[183] World Bank (2011b).

Jordan

The current generation of Jordanians has witnessed the country's rapid transition to a largely urban nation (Figure 60). Nearly 40 percent of the population once resided in rural areas, but by 2010 the share had dropped to about 17 percent. Yet even in 1980, agriculture was a small part of the economy, comprising about 8 percent of GDP. Since 2000, agriculture's share of GDP has remained at 2–3 percent.

For the last two decades of the 20th Century, growth in average incomes stalled in Jordan, and incomes in the agricultural sector were volatile. Since the start of this century, average incomes have grown overall, while income per worker in agriculture has grown to exceed the economy-wide average. In 2010, average income per worker in agriculture was 70 percent higher than GDP per capita.

FIGURE 60: STRUCTURAL CHANGE AND THE JORDANIAN ECONOMY, 1961–2011



Source: World Development Indicators (World Bank 2014h).

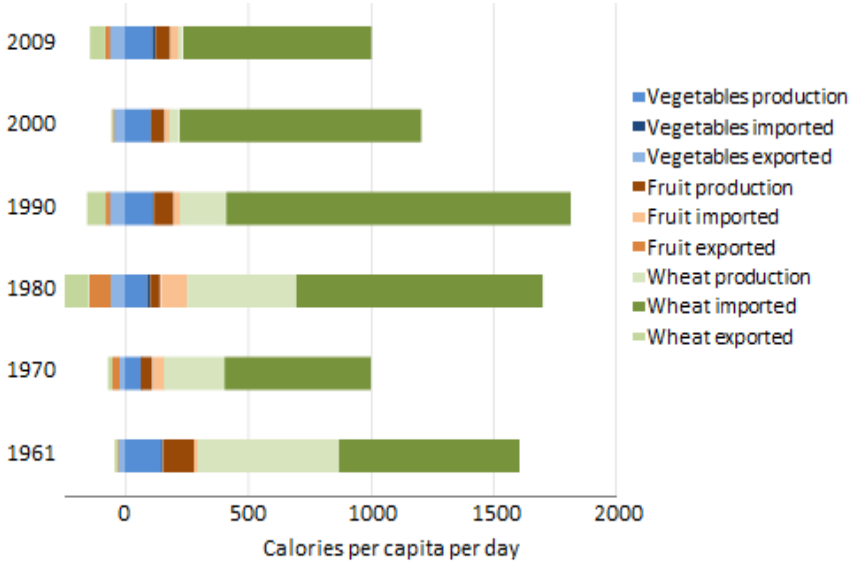
Policies and institutions

Prompted by the economic crisis of the late 1980s, Jordan took the crucial step of rethinking its agricultural policies, which had been designed to protect local production. That rethinking accelerated as Jordan prepared to join the WTO. Prior to the reforms, the government had managed agriculture through a system of fixed prices and marketing rules, overseen by the Agricultural Marketing Organization. The Agricultural Marketing Organization determined the quantities and types of agricultural products that could be imported and exported on a monthly basis.[184] In 1996, Jordan adopted a new policy to limit the government's role and rely more on markets. Jordan abolished the Agricultural Marketing Organization, lifted import restrictions, and in March 2000 ratified all WTO agreements.

[184] Malkawi (2010).

The change in policy, together with rising incomes, brought about a significant restructuring of Jordan's agricultural sector. For example, in 1985, before the policy reforms, wheat provided about half of the calories consumed in Jordan. Even though wheat imports were significant and Jordan had no comparative advantage in producing wheat, domestic wheat producers were heavily protected. Following the reforms, the structure of production and trade changed for various food sources (Figure 61), including wheat. Wheat production shrank, and domestic agriculture eventually stabilized around the production of a smaller set of higher-value products, mostly horticultural goods. Even as urbanization continued, average incomes in agriculture began to grow.

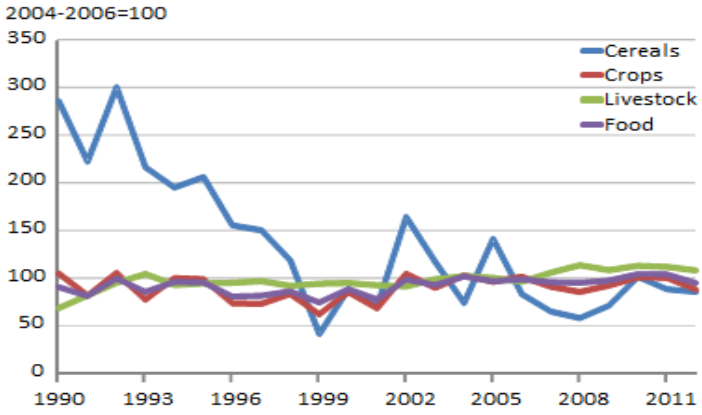
FIGURE 61: RESTRUCTURING OF FOOD SUPPLIES IN JORDAN



Source: FAOSTAT (FAO 2014).

Figure 62 depicts this transformation in a different way. Based on 2004–06 values, it shows that the most significant component of Jordan's agricultural restructuring was the decline in cereal production. Other components of the sector have been stable or seen modest increases.

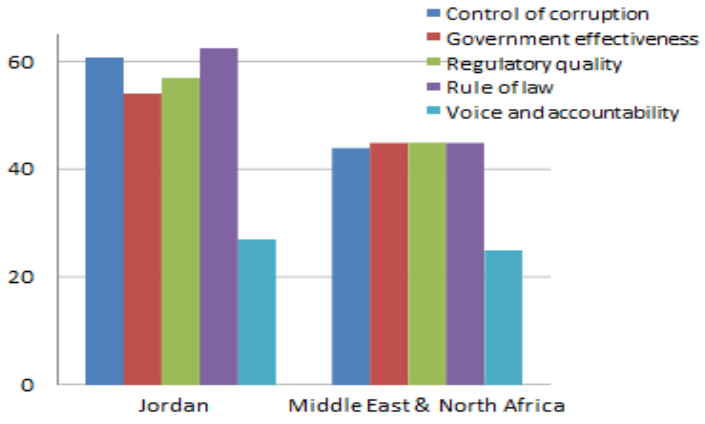
FIGURE 62: GROSS PRODUCTION INDICES IN JORDAN



Source: FAOSTAT (FAO 2014).

The government also took steps to improve governance. Figure 63 compares five key governance indicators in Jordan to the average for the MENA region in 2012. These Worldwide Governance Indicators are based on data reflecting local perceptions of various aspects of governance, gathered through surveys and other assessments by survey institutes, think tanks, NGOs, international organizations, and private firms. The voice and accountability indictor is meant to capture perceptions about whether a country's citizens can participate freely in public discourse and participate in choosing their government. The rule of law indicator reflects perceptions of whether society's rules are applied equally and whether property rights and individuals' rights are protected by courts and the police. The regulatory quality indicator has to do with perceptions that the government can implement sound policies that promote private sector development. Government effectiveness relates to perceptions about the government's ability to deliver public services and formulate and execute sound policies. Fiduciary stewardship captures

FIGURE 63: FIVE KEY MEASURES OF GOVERNANCE IN JORDAN AND THE MIDDLE EAST AND NORTH AFRICA, 2012



Source: Worldwide Governance Indicators (World Bank 2014i).

perceptions about the government's ability to control grand and petty corruption and to block efforts to use public position for private gain.[185]

As the figure shows, Jordan scores well compared to its neighbors. For each measure of governance, with the exception of voice and accountability, Jordan falls into the top half of the nearly 200 countries covered.

Table 20 reports on a separate set of perceptions about the strength of the institutions that Jordan has put into place to support the business environment. The indicators are constructed from business surveys, focusing on business regulations. Overall, Jordan ranks 119th out of 189 countries covered by the surveys, scoring poorly on credit access and protecting investors, a topic discussed in greater detail later.

TABLE 20: COST OF DOING BUSINESS RANKINGS FOR JORDAN AND SELECTED OIC COUNTRIES, 2014

	Ease of Doing Business	Starting a Business	Getting Credit	Protecting Investors	Enforcing Contracts
Kyrgyz Republic	68	12	13	22	70
Turkey	69	93	86	34	38
Azerbaijan	70	10	55	22	28
Morocco	87	39	109	115	83
Pakistan	110	105	73	34	158
Jordan	119	117	170	170	133
Indonesia	120	175	86	52	147
Egypt	128	50	86	147	156
Bangladesh	130	74	86	22	185
Uganda	132	151	42	115	117
Mozambique	139	95	130	52	145
Tajikistan	143	87	159	22	39
Uzbekistan	146	21	130	138	40
Nigeria	147	122	13	68	136
Madagascar	148	29	180	68	160
Côte d'Ivoire	167	115	130	157	88
Cameroon	168	132	109	128	175
Senegal	178	110	130	170	167

Source: World Bank 2013b.

[185] Kaufmann, Kraay, and Mastruzzi (2009).

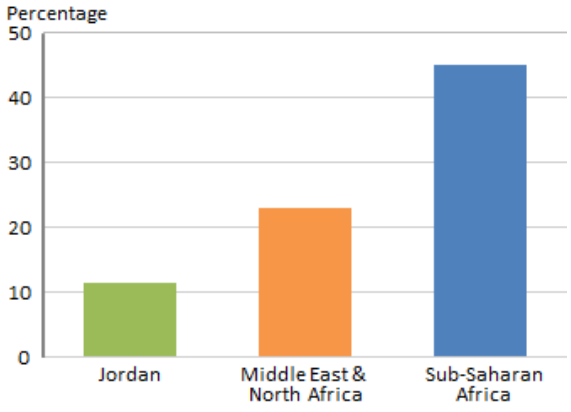
Sustainability

Agriculture has never been a large component of the Jordanian economy.: The country has limited resources to devote to agriculture. Just over 11 percent of Jordan's land is arable, which is only half of the average share of arable land in all developing countries in MENA (Figure 64). Roughly 45 percent of land in SSA's developing countries is arable.

Water is limited as well. Jordan's renewable domestic sources of water work out to about 110 cubic meters per capita per year, whereas the average across MENA's other water-constrained developing countries is six times that amount, and freshwater is 40 times more plentiful in developing SSA (Figure 65).

By adopting a set of policies that encouraged farmers to switch to crops other than wheat, Jordan was able to stabilize its freshwater use at lower levels (Figure 66), although agriculture remains the largest user of water in the country. Climate models suggest that Jordan will become hotter and drier, so finding more efficient ways to use water in rural areas will remain a policy priority.[186]

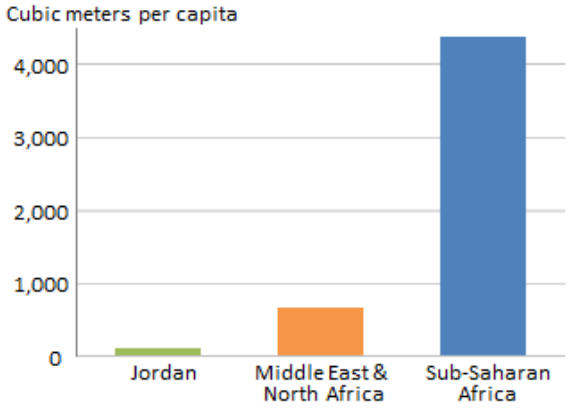
FIGURE 64: ARABLE LAND AS A SHARE OF TOTAL LAND IN JORDAN, THE MIDDLE EAST AND NORTH AFRICA, AND SUB-SAHARAN AFRICA, 2011



Source: FAOSTAT (FAO 2014).

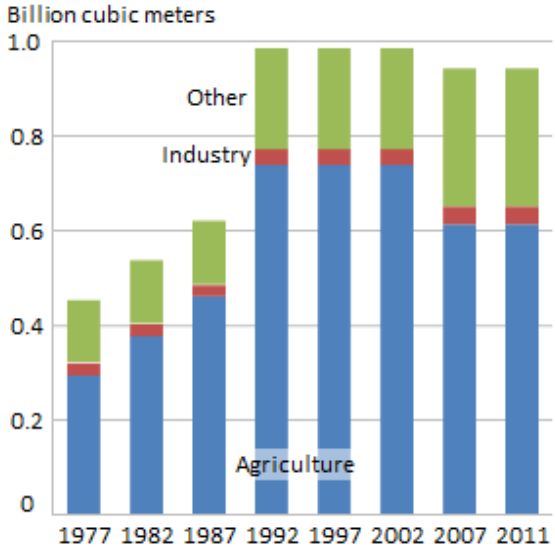
[186] Verner et al. (2013).

FIGURE 65: ANNUAL RENEWABLE FRESHWATER SOURCES PER CAPITA IN JORDAN, THE MIDDLE EAST AND NORTH AFRICA, AND SUB-SAHARAN AFRICA



Source: FAOSTAT (FAO 2014).

FIGURE 66: FRESHWATER WITHDRAWALS IN JORDAN, 1997–2011



Source: World Development Indicators (World Bank 2014h).

Markets

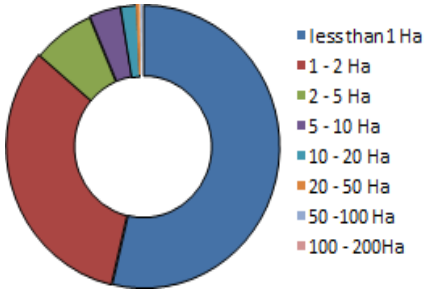
Table 21 shows the changing composition of trade in Jordan. Imports have shifted to feed grains to support domestic poultry and livestock production, while wheat imports have held steady. Exports have shifted to high-value horticultural goods and prepared food items. These changes are a key part of the structural reallocation that has resulted in a smaller sector with higher average incomes.

TABLE 21: JORDAN'S TOP IMPORTS AND EXPORTS BY VALUE (US$ 2005 MILLION)

Imports	Average (2009–11)	Average (1989–91)	Exports	Average (2009–11))	Average (1989–91)
Sugar, refined	155,583	77,335	Tomatoes	189,042	38,725
Maize	153,360	69,545	Cucumbers and gherkins	83,825	7,513
Food prep nes	140,978	18,674	Food prep nes	67,530	4,276
Cake, soybeans	112,653	25,400	Peaches and nectarines	45,325	16
Wheat	111,612	103,075	Eggplants	34,821	4,443
Meat, cattle	97,774	1,685	Beverages, non alcoholic	31,707	3,593
Meat, sheep	81,909	24,461	Chillies and peppers	29,397	3,155
Cheese (cow)	78,361	11,582	Meat, chicken	27,994	445
Meat, chicken	62,858	31,316	Cigarettes	27,728	5,471
Milk, skimmed dried	59,237	17	Meat, beef, preparations	27,012	308
Beverages	58,318	52	Meat, cattle	24,082	n/a
Tobacco products nes	47,171	504	Meat, sheep	20,715	416*

Source: Authors' calculations, based on FAOSTAT (FAO 2014) and World Development Indicators (World Bank 2014h).

FIGURE 67: FARM SIZE DISTRIBUTION IN JORDAN, 1997



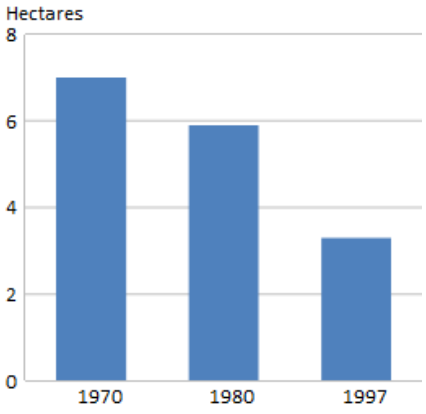
Source: Lowder, Skoet, and Singh 2014.

Despite these advantageous developments, Jordan still faces challenges in linking its farmers to markets. The share of the population living in rural areas is shrinking, yet the most recent data suggest that farms remain small. In 1997, Jordan had few farms larger than 2 hectares (Figure 67). The trend to that point was for farms to grow smaller rather than larger (Figure 68). Given the shrinking share of the population living in rural areas, a consolidation of farms might be expected. However, in absolute terms rural populations have grown. For example, the rural population in Jordan in 2012 was more than 23 percent larger than in 1980. During the same period, overall population density increased from about 25 to more than 71 people per square kilometer of land.

To link farmers, Jordan invested in transportation networks and opened domestic carriers to competition, in tandem with enacting trade reforms.

Table 22 looks at the results from a review of rural logistical systems.[187] The index provides a scaled measure of the number of rural people who live within 2 kilometers of an all-weather road as a share of the rural population in a sample of countries. In Jordan, nearly 96 percent of the population has good access to a road.

FIGURE 68: AVERAGE FARM SIZE IN JORDAN



Source: Lowder, Skoet, and Singh 2014.

TABLE 22: LINKING FARMERS TO MARKETS: ACCESS TO ROADS IN JORDAN AND SELECTED OIC COUNTRIES

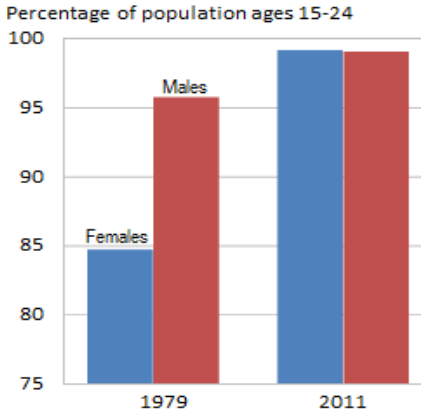
Country	Rural population share (2004)	Rural Access Index	Share of population with poor market access
Jordan	0.18	0.79	0.04
Turkey	0.33	0.69	0.10
Malaysia	0.34	0.82	0.06
Tunisia	0.35	0.39	0.21
South Africa	0.41	0.21	0.33
Morocco	0.42	0.36	0.27
Kazakhstan	0.43	0.77	0.10
Cameroon	0.46	0.20	0.37
Gambia, The	0.47	0.77	0.11
Azerbaijan	0.49	0.67	0.16
Indonesia	0.53	0.94	0.03
Turkmenistan	0.54	0.66	0.19
Côte d'Ivoire	0.55	0.56	0.25
Egypt, Arab Republic	0.57	0.77	0.13
Senegal	0.59	0.29	0.42
Uzbekistan	0.63	0.57	0.27
Pakistan	0.65	0.61	0.25
Tajikistan	0.75	0.74	0.20
Bangladesh	0.75	0.37	0.47
Afghanistan	0.78	0.22	0.61
Nigeria (8 states)	0.80	0.47	0.42
Uganda	0.87	0.27	0.64

Source: Roberts, Shyam and Rastogi 2006.

[187] Roberts, Shyam, and Rastogi (2006).

The Government of Jordan also invested heavily in education, so that when the agricultural reforms came, the labor force was better able to adapt to changes and benefit from opportunities Figure 69 shows that most young men and women were literate in 1979, although a gender gap persisted. Today nearly all young people in Jordan are literate.

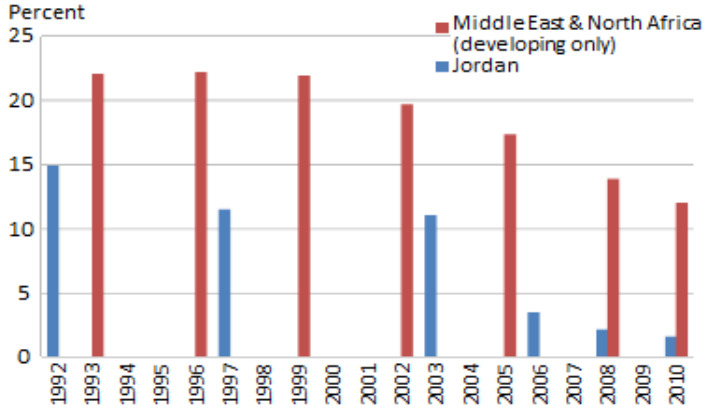
FIGURE 69: YOUTH LITERACY IN JORDAN



Source: World Development Indicators (World Bank 2014h).

In addition to the policies already mentioned, and in conjunction with other events, a broad set of policies that included social safety nets resulted in a steady decline in extreme poverty. Figure 70 shows the shares of the population living on less than US$ 2 per day in Jordan and MENA.[188]

FIGURE 70: PERCENT OF POPULATION LIVING ON LESS THAN US$ 2 PER DAY IN JORDAN AND THE MIDDLE EAST AND NORTH AFRICA



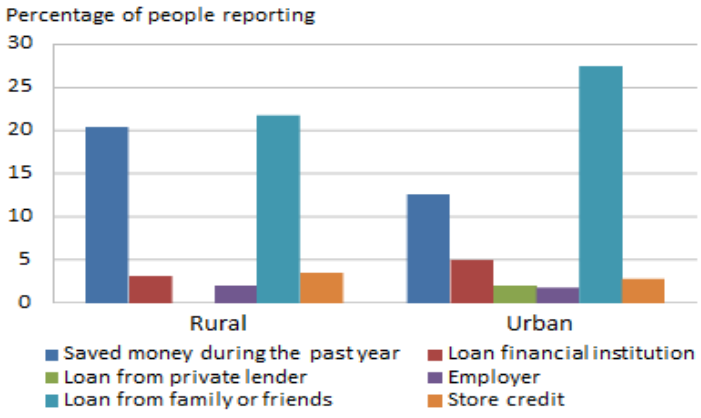
Source: World Development Indicators (World Bank 2014h).

[188] For more on social safety nets in MENA, see Silva, Levin, and Morgandi (2013).

Access to finance

As discussed, Jordan scores poorly in perceptions about how easily businesses can obtain credit. This perception is reflected in Figure 71, which reports data from the World Bank's Global Financial Inclusion database.[189] The figure shows that few of the people surveyed had received a loan from a formal financial institution. On a percentage basis, urban households were more likely to have received a formal loan than rural households, but for both groups the rate was below 5 percent. Family and friends provided most loans (slightly more than 20 percent for rural households surveyed and about 26 percent for urban households). The difficulty of obtaining credit in Jordan is exacerbated by the low rate of saving. Roughly 80 percent of rural households and nearly 88 percent of urban households in Jordan said that they were unable to save money during the year.

FIGURE 71: FINANCIAL SERVICES IN RURAL AND URBAN JORDAN



Source: Global Findex (World Bank 2014c).

Food safety

Domestic food safety standards have a relatively short history in Jordan and the Near East in general,[190] partly because most of these countries are net food importers and rely to some extent on standards imposed by authorities in exporting countries. Recent years have seen a greater emphasis on the safety of domestic and imported food sources. In Jordan, the government established the Jordan Food and Drug Administration (JFDA) in 2003. The basic legislation, Food Law No. 79/2001, charges the JFDA with ensuring that Jordan's food laws are on par with international standards and consistent with WTO rules.[191]

Lessons for other OIC countries

Since Jordan initiated policy reforms in the 1990s, average incomes have grown across the Jordanian economy; incomes in agriculture have grown even faster. The reforms reduced agriculture's economic footprint even as the share of the population engaged in agriculture shrank. Although the eventual restructuring was not without costs—for

[189] Global Findex (World Bank 2014c).
[190] Hegarty (2010).
[191] Hegarty (2010).

example, wheat producers in Jordan were displaced—the implementation of reforms, in conjunction with public investments in infrastructure, education, and social safety nets, appears to have worked. Poverty rates have fallen substantially, and as an added benefit, the country's limited water resources are being used more efficiently.

Small farmers in Jordan face the problem of managing limited water resources and accessing markets. Some farmers have found success by combining sophisticated technologies to provide fresh produce to local markets. For example, Khaireddin Shukri, a farmer in Amman, invested in equipment to reuse plentiful brackish water and adopt technologies that enable his produce to clear strict food safety standards. In 2010, he was able to provide fresh salads for McDonald outlets throughout Jordan (Seeley, 2010). This approach, requires both a sophisticated understanding of available technologies and a keen understanding of private food safety standards. Governments can help by making this type of information easier to find.

CHAPTER 3: CROSS-CUTTING LESSONS FROM THE CASE STUDIES AND GLOBAL EXPERIENCE

The urban population of OIC member countries almost doubled in the last two decades, rising rapidly from 349 million to 664 million, and the urban population share grew in 49 of 54 OIC member countries (for which relevant data are available). Urbanization transforms agriculture. It compels modernization in agricultural markets, agribusiness, and agri-food value chains in general to cater successfully to increased urban demand, the associated changes in consumption patterns, and more stringent food quality and safety requirements.

The modernizing food supply chains in OIC member countries urgently need strategies to link smallholder farmers to markets. Eighty percent of individuals whose livelihoods depend on agriculture in OIC countries are smallholder farmers. Linking them to markets is a critical step toward ensuring more inclusive development in the process of structural transformation.

Create the Right Enabling Environment

The historical data make a compelling case that structural change in agriculture is an inevitable part of development. It can be a part of a powerful dynamic that lifts rural families from poverty to prosperity. But to fully leverage the opportunities that change brings and minimize the cost of the adjustments that change requires, governments need to evaluate where they are on the path of structural change and prepare for what lies ahead.

As several case studies in the previous chapter highlighted, reforms that have encouraged the private sector's role in agricultural marketing and reduced the government's direct involvement are often associated with positive outcomes. The case studies also reveal that positive outcomes depend on certain conditions. If investments in public goods such as irrigation, roads, agricultural R&D, and extension are lacking, if major shortcomings are encountered in relevant policies and institutional arrangements, or if macroeconomic conditions are unfavorable, opening up greater space for the private sector does not necessarily translate into greater investment and benefits for smallholder farmers.

All of the case studies reinforce the importance of a sound investment climate and enabling environment for creating a platform that encourages private investment to increase smallholders' capacity to raise productivity and link into markets. The "investment climate" is the policy, institutional, and behavioral environment, both present and expected, that influences the returns and risks associated with investment. The investment environment is generally seen as having three main features: macroeconomic conditions, governance, and infrastructure. The sections that follow look at these features through the lens of their influence on smallholders' access to markets.

Macroeconomic factors, enabling policies, and governance

Exchange rate, trade, and price policies all substantially affect the extent to which smallholder farmers participate in and benefit from agricultural markets. Historically such policies tended to tax agricultural producers through overvalued currencies and direct taxation of commodities. Reforms in the 1980s and 1990s reduced direct and indirect taxation. Table 23 presents data on the nominal rates of assistance to agriculture for a subset of OIC member countries for which comparable data are available. While some countries such as Mozambique have gone from taxing to supporting farmers on average, others such as Côte d'Ivoire still tax farmers heavily.

Aggregate nominal rates of assistance mask significant differences in taxation and protection between agricultural imports and exports and among products. An average nominal rate of assistance close to zero at the country level simply indicates no net taxation, but it could be the result of large import tariffs offsetting large export taxes.[192] In some countries exports are still heavily taxed, while imports are protected. This is the case in Mozambique, where food crops such as cassava and maize have received hardly any government support or intervention, whereas others, such as cashews, have been subject to heavy intervention.

TABLE 23: NOMINAL RATES OF ASSISTANCE TO AGRICULTURE

Country	1975–79	1980–84	1985–89	1990–94	1995–99	2000–04
Bangladesh	1.4	–3.3	11.7	–1.5	–5.2	2.7
Cameroon	–14.4	–11.2	–2.4	–1.1	–1.3	–0.1
Côte d'Ivoire	–30.8	–32.2	–24.3	–19.5	–20.0	–24.5
Egypt, Arab Republic	–15.9	–9.2	56.6	–6.1	4.0	–6.1
Indonesia	9.3	9.2	–1.7	–6.6	–8.6	12.0
Malaysia	–13.0	–4.6	1.3	2.3	–0.2	1.2
Mozambique	–34.5	–25.2	–32.0	–2.7	3.9	12.4
Nigeria	6.3	9.4	8.2	3.9	0.4	–5.4
Pakistan	–8.5	–6.4	–4.0	–6.9	–1.6	1.2
Senegal	–22.7	–20.5	4.7	5.6	–6.1	–7.5
Sudan	–24.3	–29.3	–35.4	–47.8	–24.5	–11.9
Turkey	–8.0	–30.0	4.0	20.0	21.0	20.0
Uganda	–-17.6	–6.2	–6.8	–0.6	0.5	0.4

Source: Anderson and Martin 2007; Anderson and Masters 2007; Burrell and Kurzweil 2007.

In addition to macroeconomic and trade policies, the quality of policies and regulations related to agricultural inputs (seed, fertilizer, irrigation, and drainage), land, natural resources, domestic marketing, agricultural R&D, extension, food safety, biosafety, grades and standards, plant protection, and animal health measures all influence the effectiveness and efficiency of markets and the extent to which smallholders access and benefit from markets (for an example from Chile, see Box 3). Policies intended to prop up traditional crops or to anticipate emerging winners will likely fail, but policies that support farmers and investors along the value chain can provide a framework that promotes adaptation and success for the sector as a whole. Beyond these considerations, a country's contract

[192] World Bank (2007).

law, competition policy, investment policies, regulations (of the environment, labor, health, and safety), and procedures for starting a business, getting utility connections, registering property, and obtaining finance are also important.

BOX 3: CHILE'S SUCCESSFUL FRUIT EXPORT INDUSTRY SHOWS THE IMPORTANCE OF A GOOD ENABLING ENVIRONMENT FOR LINKING FARMERS TO MARKETS

In the early 1960s, Chile exported 18,450 tons of fresh fruit, valued at US$ 20 million. By 2012, it was exporting 2.5 million tons of 75 species of fresh fruit, valued at US$ 4 billion, to more than 100 countries. Fruit exports generate more than 1.4 million jobs and employ 8.3 percent of the population today. Three factors have been central to the industry's phenomenal success.

Cooperation between the public and private sector was close and productive. As part of its overall trade policy, Chile created a legal framework for trade that favored limited government intervention and free market conditions. Policies for the horticultural sector were developed in a collaborative, transparent process that ensured their adoption. The government vigorously negotiated quality and safety standards with clients and implemented them. It also provided strong support to innovations and private initiatives that promoted export horticulture. Private organizations representing producers, traders, and other industry players clearly communicated their needs and cooperated closely with the government to determine the most efficient, effective use of public financial resources and technical assistance to match private investments.

Robust programs for research and development (R&D) and capacity building helped the sector maintain its competitive edge. The R&D program quickly responded to market and logistical challenges by developing new farming techniques and breeding fruit varieties that satisfied consumers' preferences and were suited to long-term transport and storage. To meet new market challenges and keep up with technological innovations, specialized training agencies continually upgrade the skills of all workers, including temporary workers.

A skillful export promotion strategy was essential. The industry strategically targeted a range of individual buyers, including fresh fruit importers, retailers, wholesalers, distributors, food service companies, and secondary consumers. An even more important strategy was to promote fresh fruit from Chile under a unified brand that made Chilean products easily recognizable. The sector also dedicated significant resources to export promotion, such as trade fairs, trade missions, online product promotions, and more targeted consumer advertising.

Source: Authors, based on Larson, Khidirov, and Ramniceanu 2014.

As indicated in the example from Chile, close cooperation between the public and private sectors has been essential for successfully linking farmers to markets. Private investment in the agricultural sector offers significant potential to complement public resources. Several of the case studies presented in the previous chapter highlighted the importance of domestic investment as well as FDI in modernizing and upgrading agri-food value chains. Some large investments in agriculture have managed to achieve broad-based benefits for rural producers through contract farming, other outgrower arrangements, and joint ventures with local communities. Investments of this kind have received much attention in recent years, yet to maximize the benefits and minimize the negative effects of such investments for rural producers, some key policies need to be in place and some key practices followed. Box 4 summarizes the key policies and practices for responsible investing in agriculture.

BOX 4: KEY POLICIES AND PRACTICES FOR REPSONSIBLE AGRIBUSINESS INVESTMENT

A recent World Bank report surveyed 39 large-scale mature agribusiness investments in Sub-Saharan Africa and southeast Asia to assess how to organize and manage such investments in the most socially, economically, and environmentally responsible ways. The positive impacts of agribusiness investments cited by local stakeholders included specific benefits tied to the investments. Job creation was high on the list. Some outgrower schemes provided markets for 150,000 contract farmers. Other agribusiness investments brought improvements in infrastructure—roads, water supply, and health. The most frequently mentioned negative impacts involved losing access to land and water resources. For investment projects that acquired land, more than 35 percent of the stakeholders interviewed said that losing access to land was a negative effect of the project, and about 10 percent mentioned the loss of access to water. Investors often complained about host-country policies, regulations, and poor infrastructure.

Other notable negative outcomes included disputes between investors with formal land rights and those with use-rights. In some cases, the land acquisition conditions and process were opaque. When problems arose, no mechanism was in place to investigate the causes and offer redress if needed.

The report lists a number of key policies and practices for government, investors, and civil society to maximize the benefits and minimize the negative effects of large-scale agribusinesses.

GOVERNMENT

• Rigorous prescreening of potential investors' experience, financial capacity, and technical capabilities.
• Obtaining commitments from foreign investors for social development programs, employment, and other benefits to the host country, as well as a detailed schedule for the development of operations.
• Ongoing monitoring of investors' agreements and commitments.
• Monitoring consultations and social and environmental impact assessments (SEIAs), but not conducting them on investors' behalf.
• Clear, transparent regulatory framework for land acquisition (purchase or lease), consultations, resettlement, and compensation.
• Formalized local community tenure rights under a proper land registry system.
• Approval of foreign investment applications in line with capacity to screen and monitor investors.
• Encourage phasing of investments, rather than mega-land deals (for example, provision of an initial allocation of land, with further allocations contingent upon successful development).
• Monitoring and enforcement of adherence to environmental and water regulations.
• Encouragement of innovation (new crops, technology, and so on), but not initially on a large scale.
• Reducing red tape and creating an enabling environment for foreign investment and the development of domestic industry.

INVESTORS

• Early engagement and consultation with surrounding communities, including previous and existing users of the land.
• Transparency about the operation and ongoing dialogue with external stakeholders, including a formal grievance procedure.
• Social development programs that reflect local communities' development visions.
• A financially inclusive business model.
• Proper conduct of SEIAs and integration within business models.
• Setting of and adherence to realistic expectations about the pace of development of operations; use of land in accordance with commitments.
• Phasing of the investment—applying for and successfully developing a parcel of land before seeking a larger allocation.
• Fair and adequate remuneration, contractual conditions, and training for employees and outgrowers.
• Resolution of the business model prior to introducing outgrowers.

CIVIL SOCIETY

• Engagement with investors to help them forge partnerships with marginalized groups and ensure that relevant stakeholders are included in decision-making processes.
• Assistance to local communities is well organized; communities understand their rights and how to exercise them.
• Monitoring conflicts between investors and stakeholders and constructively drawing attention to issues.

Source: World Bank 2014g:xix.

Infrastructure and trade logistics

Infrastructure refers to the quality and quantity of physical infrastructure such as transport, power, and information and communications technology (particularly telecommunications). More broadly, infrastructure can also refer to financial infrastructure (such as banking) and access to finance (described in the next section).

TRANSPORT

Poor access to transport limits opportunities for smallholders because it increases the costs of production as well as marketing. Data on rural access indicate that in 2004 only 53 percent of the rural population in OIC member countries (Annex Table 1.23) had access to an all-season road within two kilometers (typically equivalent to a walk of 20–25 minutes). As the Uganda case study demonstrates, households located far from major roads and urban centers are much less likely to market a large portion of what they produce.

The poor quality of roads not only compounds post-harvest losses (as seen in the Nigeria case study) but limits farmers' choice of crops to produce, often preventing them from growing high-value, perishable crops that must be shipped to a trader or processor very soon after harvest. In Mozambique, the wholesale price of a 50-kilogram bag of dried cassava roughly doubles over a 200-kilometer distance, from about MT 160 per bag in Namina to MT 350 per bag in Nacala Port.[193] This outcome is bad for smallholders, who receive lower prices, as well as consumers, who end up paying higher retail prices.

Investments to improve road infrastructure and extend and upgrade rural feeder roads in main production zones tend to have high payoffs. Investments in ports and railway systems are also critical in many countries. It is not enough to invest in new infrastructure and upgrade existing infrastructure; adequate attention also needs to be given to funding its operation and maintenance.

ELECTRICITY

Access to electricity—as well as its cost and the reliability of supply—influence the market opportunities available to smallholders, their production costs, and marketing costs. In about 45 percent of OIC member countries, less than half of the rural population has access to electricity (Annex Table 1.22). As the Bangladesh case study shows, increased access to electricity was an especially important factor in expanding cold storage facilities for potatoes and enabling farmers to command a higher price for their produce than if they had sold it immediately after the harvest. Farmers in Bangladesh earned an additional 40 percent of the margin in the potato value chain when they stored part of their potato crop.[194]

TELECOMMUNICATIONS AND OTHER INFORMATION TECHNOLOGY

[193] Dononvan et al. (2011).
[194] Reardon et al. (2012).

Access to market information has exploded with the proliferation of mobile phones. Mobile phones make it possible to convey timely, accurate information on prices, buyer contacts, distribution channels, specifications for grades and standards, and storage recommendations. Such information significantly reduces the transaction costs for smallholders. The case study from Bangladesh highlights how mobile phones have reduced the number of intermediaries in the potato and rice value chains. Because of mobile phones, farmers can bypass village traders and sell directly to wholesalers.

In Nigeria, mobile phone technology enables the government to target smallholder farmers more effectively and improve their access to agricultural inputs under the government's Growth Enhancement Scheme (GES). The GES provides farmers with a 50 percent subsidy for fertilizer and a 100 percent subsidy for high-yielding hybrid seed (to speed adoption). The difference between the GES and traditional input supply schemes is that farmers receive electronic vouchers for subsidized seed and fertilizer on their mobile phones; the vouchers are used like cash to redeem the inputs from registered private agro-dealers across the country. This e-wallet system, the first of its kind in Africa, has revolutionized the marketing and distribution of agricultural inputs (Box 5).

In Uganda, the Community Knowledge Worker program of the Grameen Foundation provides agricultural extension services by combining mobile technology and social networks. In tandem, these information channels give smallholders access to accurate, timely advice that helps them protect their crops and animals, improve their yields, and get better market prices (Box 6).

BOX 5: SCALING UP NIGERIA'S E-WALLET SYSTEM FOR PROVIDING INPUTS TO MILLIONS OF FARMERS

Under Nigeria's Growth Enhancement Scheme, the first step in providing vouchers for agricultural inputs to large numbers of farmers was to register the farmers. Optical Market Reading forms were deployed across the country, to every ward in every Local Government Area. Some 11,000 enumerators were employed to register farmers, and the collected data were scanned into a Farmers' Registration Database. Farmers' biometric information was captured, and each farmer now has a unique farmer identification card. Of an estimated 14 million farmers in the country, 10 million have been registered.

In 2012, within 120 days of developing and deploying the e-wallet system, vouchers for subsidized seed and fertilizer were sent to 1.5 million farmers via their mobile phones. The percentage of farmers who accessed subsidized seed and fertilizer increased from 11 percent under the old system to 70 percent under the e-wallet system.

The availability of biometric information on farmers at this scale will undoubtedly affect their access to other products and services. For example, it has triggered interest from banks across the country. The banks recognize the advantages of being able to reach millions of farmers directly with loan, savings, micro-insurance, and other products.

Source: Authors, based on Adesina 2013.

BOX 6: VISIBLE IMPACTS OF MOBILE TECHNOLOGY ON KNOWLEDGE AND INFORMATION FOR UGANDA'S FARMERS

Over the past three years, Grameen Foundation has reached over one million rural Ugandans by building a network of 1,100 "Community Knowledge Workers," local community members enabled by technology to deliver relevant and actionable agricultural information. Community Knowledge Workers use their mobile phones to provide farmers with agricultural tips and advice, weather forecasts, market prices, an input supplier directory, and detailed farming information on crops and livestock.

The impact of this approach is visible in the strong adoption of new agricultural practices in the more than 20,000 villages reached by Community Knowledge Workers. As farmers gradually shift from subsistence to forms of commercial agriculture, their demand increases for better markets, more inputs of better quality, and financial services tailored to their cash flows. A system such as this one, building on village social networks and information supplied through mobile technology, may be in the best position to help farmers meet those demands.

Source: Authors, based on World Bank 2012c.

Improve access to agricultural finance

Improving access to finance will go a long way in linking smallholder farmers to markets. Access to finance enables smallholders to invest in new technologies and purchase better inputs to improve productivity and raise their incomes. Access to finance is also critical for input providers and processors, who occupy key positions in the value chains that link smallholder farmers to markets. Despite the rapid development of financial services, a majority of smallholders still have no access to them. On average, across OIC member countries only 7 percent of the rural population had received a loan from a formal financial institution in 2011 (see Annex Table 1.27). The barriers to access, and innovations designed to overcome them, are detailed here.

BARRIERS TO ACCESS

Smallholders' access to agricultural finance is limited because this type of finance has higher transaction costs and risks. Producers are often widely dispersed, and financial service providers are reluctant to install permanent facilities in areas with low population densities and poor infrastructure. The seasonality and high covariance of rural production activities increase the risk of lending to farmers. Limitations on the types or availability of collateral for loans (farmers may lack title to their land, land values may be low) and a suboptimal policy and regulatory environment for the financial sector can also reduce access to agricultural finance.[195] Lacking any formal channel for obtaining credit, many smallholders can only resort to borrowing from informal sources (family, friends, or moneylenders), some of which typically charge high interest rates and have limited potential to expand.

[195] World Bank (2008); IFC (2012).

Poor access to agricultural finance is a major reason for smallholders' suboptimal production mix, adoption of low-risk/low-yield production patterns, limited use of inputs, and inevitably smaller yields and poor quality produce. The lack of credit can also limit farmers' marketing options, forcing them to become price takers at the farm gate (Table 24).

Ordinarily, banks will not invest adequately in understanding the nature of demand from the agricultural sector and the nuances of the different value chains. This lack of information leads banks to design financial products that are inappropriate to most rural activities. For that reason, even when formal finance is available, the products on offer may not match producers' needs and tend to have heavy collateral requirements. Wealthier farmers can obtain larger loans at lower costs from formal lenders because they can credibly pledge assets or future cash flow—an option that is usually not available for poorer smallholder farmers. Farmers who qualify for formal loans may still turn them down, because they do not want to lose collateral.[196]

TABLE 24: IMPACTS OF POOR ACCESS TO FINANCE ON VALUE CHAIN PARTICIPANTS

	Impact on the processor	Impact on the producer	Impact on the input provider
Lack of credit for the processor	• Cannot secure sufficient volumes. • Cannot hold stocks in order to operate most efficiently.	• Delays in milling and processing, resulting in storage costs and potential sales losses.	• Producers cannot create high-quality goods, so lack incentives to utilize inputs.
Lack of credit for the producer	• Volume shortfalls, resulting in running factory inefficiently. • Lack of economies of scale. • Difficulty in obtaining standard grades. • High cost of capital per production unit. • Limited capacity to absorb fixed costs associated with processing.	• Suboptimal production mix. • Adopts low-risk, low-yield production pattern. • Asymmetric price information causes producers to be price takers at the farm gate. • Limited use of inputs, lowering yield and quality.	• Reduced demand for inputs by producers.
Lack of credit for the input provider	• Volume shortfalls, resulting in running factory inefficiently. • Lack of economies of scale. • Difficulty in obtaining standard grades. • High cost of capital per production unit.	• Has to buy inputs expensively due to the high costs of inputs, uncertainty regarding sales volume, and high risk associated with selling on credit.	• Provide inputs expensively due to the high costs of inputs. • Difficulty maintaining adequate stock, uncertainty regarding quantity to be sold.

Source: AfDB 2013.

[196] World Bank (2007).

INNOVATIVE MODELS FOR PROVIDING FINANCING TO FARMERS[197]

Innovations are needed to permit more flexible forms of agricultural lending while guaranteeing that borrowers repay. A recent study by the IFC points out that many innovations in agricultural financing exist, but they are not widely known and have not been monitored and evaluated systematically.[198] The sections that follow describe some of the models identified in the IFC report.

The appropriate type of agricultural financing and financing models will differ across OIC member countries depending on the enabling environment. The relevance of different financing models will also vary within countries based on the type of crop produced (for example, an export crop versus a staple) and the characteristics of farmers.

Direct smallholder financing. Several innovations have been tested to help commercial banks reduce the risk of lending directly to farmers. In Kenya, lending to smallholders by a commercial bank was supported by a first-loss guarantee provided by donors. Equity Bank's smallholder financing product—Kilimo Biashara ("agribusiness")—is designed to make financing available for 2.5 million farmers and 15,000 agricultural input retail businesses in rural areas. Equity Bank enhances the security of its loans by capping loan exposure at US$ 17,000 per farmer; applying group lending terms, whereby six farmers act as co-guarantors; and reducing the cash amounts in farmers' hands (for example, farmers can pay agro-dealers out of their Kilimo Biashara credit). Technical assistance for farmers in financial literacy and farm management, provided by the government extension service bureau, was instrumental to the program's success.

Indirect lending through farmer-based organizations and cooperatives. In this model, also known as a wholesale model, a bank lends indirectly to smallholders through an aggregator organization, such as a farmer-based organization or cooperative. Because the entire group is the borrower, group members act as guarantors for one other, and the costs of assessing creditworthiness and administering loans are lower for the bank. The security of the model can be enhanced by requiring the organization to meet a cash collateral requirement instead of demanding traditional collateral or claims on harvest proceeds from the individual farmers. Another means of enhancing security is for the bank to manage the credits directly with input suppliers to reduce the amounts of cash disbursed directly to farmers.

Input financing linked to savings accounts. In Tanzania, the National Microfinance Bank's Kilimo Account product is designed to help farmers manage credit and collateral. A farmer opens a personal savings account at the National Microfinance Bank and then applies for a Kilimo Account (a loan account). After harvest, the farmer deposits part of the harvest proceeds in the Kilimo Account, which is then used as cash collateral for input financing in the following season. The success of this model derives from its strong checks and balances, which prevent farmers from "gaming" the system. The checks include "know your customer" signals, such as requirements for customers to supply references or proof

[197] This section draws heavily on IFC (2012).
[198] IFC (2012).

of membership in a farmer association. Balances include strong savings incentives and bonuses for high savings balances over longer periods.

Equipment finance. This option typically consists of loans to farmers to purchase equipment directly from the equipment vendor.

Leasing. A lease is a contractual arrangement between two parties whereby a party that owns an asset (the "lessor") lets another party (the "lessee") use the asset for a predetermined time in exchange for periodic payments. Leasing focuses on the lessee's ability to generate cash flow from business operations to service the lease payment, rather than on the balance sheet or on past credit history. Examples from OIC member countries such as Pakistan and Uganda show that leasing can successfully finance the acquisition of productive assets. The leasing entities that focus on the agricultural sector are often linked to manufacturers or distributors of agricultural equipment in one way or another. Lease financing only partially overcomes the typical constraints to credit financing, as leasing firms in developing countries often take additional collateral from rural clients and require down payments.

Warehouse receipt financing. Warehouse receipt finance is a form of secured lending to owners of non-perishable commodities, which are stored in a warehouse and have been assigned to a bank through warehouse receipts. Warehouse receipts give the bank the security of the goods until they have been sold and the proceeds collected. Given the limited collateral available to support farmers' financing needs, such post-harvest commodities and warehouse receipts represent a liquid form of collateral against which banks can lend. When a well-functioning warehouse receipt system is in place, farmers have a choice in deciding whether to sell immediately after harvest (when prices are often lowest) or to store in a licensed warehouse and to apply for a short-term credit (thus enabling farmers to sell at a later date, when prices may be higher).

The conditions for a warehouse receipt system in which smallholder farmers can participate are many. They include: a legal environment that ensures easy enforceability of the security, and makes warehouse receipts a title document; reliable and high-quality warehouses that are publicly available; a system for licensing, inspecting, and monitoring warehouses; a performance bond and/or indemnity fund; banks that trust and use the system; agricultural market prices that reflect carrying costs; supportive public authorities; and well-trained market participants. Even with these conditions in place, warehouse receipt systems have some risks, including the risk of fraud or collusion; credit and counterparty risk; storage risk and misappropriation by warehouse operators; price risks, given the volatility in agricultural commodity prices and government price intervention; marketing or buyer risks; and legal risks concerning perfection of security, registration of prior claims, and enforceability.

Value chain financing for farmers. Value chain financing (VCF) and financing through interlinked agents is increasingly recognized as an important source of agricultural finance. Linking credit delivery to other products and services along the supply chain through trade finance can reduce the adverse impact of asymmetric information; decrease the high transaction costs of both creditors and borrowers; and ensure better and more

intensive, high-quality input use within a more rational and comprehensive production, marketing, and finance framework. In addition, the enhanced transparency obtained with respect to commodity prices has the potential to improve farmers' bargaining position with traders in determining sale price. The buyer security models are structured so that the bank relies upon the buyer contracts (verbal or written) to help secure its loans. The downside of these arrangements is farmers' dependence on a single buyer: When the buyer disappears or defaults on his or her obligations, the whole supply chain collapses and takes farmers' repayments with it.

VCF models are divided into four categories, according to the characteristics of different value chains: (1) tight VCF with output buyers; (2) loose VCF with output buyers; (3) nucleus outgrower models; and (4) VCF with input suppliers.

In tight VCFs, side-selling is very costly or even impossible. These characteristics are also applicable to most nucleus outgrower financing models, in which nucleus farms typically give outgrower farmers access to processing, transport, and markets for cash crops (such as the model described for oil palm in the Indonesia case study). Financing for tight value chains is generally easier and more prevalent than financing for loose value chains, which typically feature easily marketable, staple crops. There are few success stories of VCF in staple crops such as maize, cassava, wheat, and groundnuts, however. For those crops, the side-selling risk is naturally higher, because there are many buyers and crops can be sold in local markets.

Value chain finance with input suppliers. Banks interested in financing smallholders may choose to pursue lending directly to local agricultural input dealers but leave the provision of credit to individual farmers completely in the hands of the agro-dealers themselves. In India's e-choupal (village input kiosk) system, the State Bank of India (SBI) partnered with a private company (ITC) to make affordable loans available to farmers for input purchases. ITC facilitates all documentation and verification procedures, thereby reducing associated costs to the bank and allowing the bank to offer more favorable loan terms to more farmers. ITC also allows SBI to manage and monitor credit risk effectively through the local knowledge and support of platform operators and ITC data on farmers' transactions.

Factoring. Factoring is based on a company selling its accounts receivable (A/R) to a bank or factoring company at a discount. Factoring differs from the VCF models described previously, because the A/R are generated only when goods have been delivered but cash payment is still forthcoming. The company selling its A/R realizes benefits by receiving cash earlier than it would under the terms of the receivable and can thus use the cash received for immediate investment in working capital.

Trade financing. Trade financing essentially provides credit to finance international trading transactions of small and medium agricultural enterprises. Banks may assist by providing various forms of support. For example, the importer's bank may provide a letter of credit to the exporter or the exporter's bank, providing for payment upon presentation of certain documents, such as a bill of lading. Alternatively the exporter's bank may make a loan by advancing funds to the exporter on the basis of the export contract.

Promote Appropriate, Market-based Institutional and Organizational Arrangements

Previous chapters have described how modern retailing outlets and supermarkets are profoundly changing the structure of production and wholesale marketing. Supermarkets and modern retail outlets increasingly bypass spot markets and turn to modern procurement systems to source produce. They may rely on dedicated wholesalers or move on to buy directly from farmers—individual farmers, farmers in chain-agribusiness relations, or groups of farmers belonging to producer organizations or cooperatives.
Producers who supply supermarkets and processors frequently must conform to these buyers' private standards, which tend to exceed national standards.[199] Because it is difficult for smallholders, with their very limited assets, to meet rigorous quality and safety standards, smallholders' exclusion from modern agri-food supply chains is a real and growing concern. Supermarket buying agents and agents for other agribusinesses may also prefer to purchase from medium and large farmers because the transaction costs are lower than the costs of purchasing small amounts from a large number of dispersed smallholders. Working with a group of farmers, rather than a large number of individuals, also reduces the costs of disseminating information on agricultural practices, quality, and other buyer requirements.

Modern food retail outlets (supermarkets and hypermarkets) account for an increasing share of food retail in transforming, urbanizing, and urbanized economies (Table 25). For example, Turkey's mini-markets, convenience stores, and supermarkets account for 54 percent of food retail; the comparable figures for Malaysia and Indonesia are 45 percent and 44 percent, respectively. In other OIC member countries, such as Nigeria and Bangladesh, traditional markets and grocery stores are still the main food retail formats. As urbanization intensifies and incomes grow, however, modern retail formats are expected to expand rapidly. In several Asian countries (China, India, Indonesia, and Malaysia), supermarket sales expanded faster than GDP growth.[200] One reason for this development is that as incomes grow and more consumers enter the middle class, food safety becomes a more sensitive issue. As consumers become more aware of food safety issues, they tend to shift from wet markets to supermarkets. Another reason for burgeoning supermarket sales is that sourcing efficiencies and scale enable supermarkets to charge lower prices than wet markets and attract even more customers. [201]

TABLE 25: PERCENTAGE SHARE OF FOOD RETAIL BY RETAIL FORMAT IN SELECTED OIC COUNTRIES

Food retail format	Indonesia	Nigeria	Bangladesh	Turkey	Malaysia
Traditional markets, grocery stores	55.8	65	–	46	56
Mini markets, convenience stores	22.4	34	–	54[a]	1
Supermarkets, hypermarkets	21.8	1	2		43

Source: USDA Gain Reports.
a Includes mini-markets, convenience stores, and supermarkets.

[199] Reardon (2011).
[200] Reardon (2011).
[201] Reardon (2011).

Market-based institutional and organizational arrangements are needed to ensure that modern agri-food supply chains include smallholder farmers. While private sector investments have led the transformation of agri-food value chains, the public sector can play an important complementary role by helping smallholder farmers expand and upgrade their assets and practices to meet the new requirements for supermarkets and other coordinated supply chains (see Box 7, Box 8, and Box 9). Table 26 outlines public and private options for strengthening smallholders' links to markets, particularly the investments and policies required to address different issues related to smallholders' participation.

Smallholder women farmers are often more likely to be excluded from transforming agri-food supply chains than men due to numerous factors, including lower mobility, less access to training, less access to market information, and less access to productive resources.[202] In some cases where marketing opportunities have become more lucrative, men have tended to displace women from production and marketing activities that they traditionally perform. These factors need to be carefully considered (using tools such as a gender disaggregated value chain analysis) to ensure that women as well as men have equal opportunities to benefit from transforming agri-food supply chains.

BOX 7: LINKING ETHIOPIAN SMALLHOLDER FARMERS TO MARKETS THROUGH A COMMODITY EXCHANGE

The Ethiopia Commodity Exchange (ECX) was established in 2008 to overcome barriers to transactions by farmers and buyers in the informal market and to facilitate timely distribution of commodities from surplus to deficit areas (predominantly from southern to northern Ethiopia). Aside from serving as a platform for farmers and buyers to meet and trade commodity-linked contracts, ECX also functions as a third-party guarantor of such transactions.

Farmers and buyers of commodities face serious obstacles in Ethiopia. Farmers are often located far from markets, find it costly to transport commodities to markets, and lack market information. Access to warehouses and storage technology is poor, commodity prices are volatile, and payment delays can be severe. Buyers find it difficult to enforce contracts. They report that the poor quality of produce supplied by farmers often makes it difficult to meet export obligations.

To address such constraints, ECX maintains not only a trading platform but operates a data center, warehouse, clearing center, and delivery site for its members, who include farmers (or their representatives) and buyers (including processors, millers, exporters, and large-scale purchasers such as the World Food Programme). ECX enforces trading rules and standards for all members, as well as the legal guarantees mentioned earlier. The exchange performs quality checks, grading, weighing, certification, and further storage, thus addressing buyers' needs for reliable supplies that meet quality and quantity requirements. The exchange guarantees the price of transactions for farmers and provides payments and warehouse receipts the next day. Farmers and buyers can use the receipts as collateral to obtain loans at partner banks.

In three years of operation, ECX linked 2.4 million small-scale farmers to buyers. Trading volumes increased more than threefold, with values reaching US$ 1.1 billion. The storage operation expanded from the initial site in Addis Ababa to 55 sites in 17 regions, with 17 delivery sites. Farmers and buyers now obtain real-time market data through electronic ticker boards in multiple rural areas, toll-free calls, mobile messaging, the ECX website, and media outreach. As a result, member farmers' shares in the final sales price increased from 30 percent to over 60 percent of the FOB price. Farmers who do not trade directly through the exchange use the ECX price as the reference price for their transactions. More than 15 million farmers are

[202] World Bank (2009a).

estimated to use the ECX price as a reference for local market prices, with the result that they have reduced the margin between the local and ECX price by nearly 50 percent.

Source: Authors, based on Everitt 2012; Gabre-Maghi 2011; USAID-EAT Project and University of Illinois 2012; EC 2013.

BOX 8: AN INNOVATIVE AGENT MODEL SUPPORTS MARKET LINKAGES IN ZAMBIA

To increase productivity, farmers need access to inputs such as fertilizer, other kinds of production technology, and training. To market their produce, farmers require access to business management services such as information and communication technology (ICT) and finance. Often smallholders—from semi-subsistence growers to growers with a substantial share of produce to market—are excluded from formal market participation because they cannot access such inputs and services.

An innovative *agent model* for agricultural extension in Zambia helps farmers, including small-scale producers, to gain better access to markets by offering incentives for extension service providers to act as the critical link between farmers, input suppliers, and buyers. Extension agents become paid participants in the value chain, with payments depending on the number of farmers they link through formal contracts with input suppliers and large-scale buyers such as millers, brewers, and organizations such as the World Food Programme. The approach has worked well for smallholders in Zambia, where numerous input and service providers already support a commercial farming sector that produces major traded grains such as maize, wheat, and barley.

The model, jointly developed by the United States Agency for International Development and the Cooperative League of the USA in Zambia, has strengthened smallholders' access to critical services. Smallholders have gained direct access to local supply chains, have grown competitively, and have developed strong, sustainable market participation. The model has benefited extension service providers by enabling them to move away from their traditional role as providers of a "free" service (which in reality is often a burden on state budgets) to become co-investors and active agents in the supply chain.

Source: Authors, based on Ferris et al. 2014.

BOX 9: AFFORDABLE TECHNOLOGY IMPROVES FOOD SAFETY AND MARKET ACCESS IN MALAWI

In the 1960s, more than 90 percent of world groundnut exports came from five countries in Sub-Saharan Africa (SSA), but by 2013, SSA's share of groundnut exports had fallen to 5 percent. This drastic reduction resulted from importing countries' adoption of new, strict standards that limited levels of aflatoxins. Aflatoxins are highly carcinogenic, potentially deadly toxins produced by fungi that contaminate groundnuts, maize, sorghum, and cassava in hot and humid conditions, especially in the tropics and subtropics. Meeting the new standards required substantial investments in infrastructure, systems, and management practices that African governments and smallholders could not afford. Countries capable of meeting the standards, such as China, Argentina, and the USA, took over the market.

The Centers for Disease Control and Prevention and the World Health Organization report that aflatoxins are linked not only to liver damage and cancer but to childhood stunting, immune disorders, and maternal anemia. According to the Food and Agriculture Organization, around 4.5 billion people are chronically exposed to aflatoxin contamination. For African countries, which trade around 60 percent of groundnut production in "informal" local markets, aflatoxins remain a major public health concern.

Aflatoxin contamination can occur at several points along the supply chain, from the farm to post-harvest handling and consumption. For example, softening groundnuts in water to ease manual shelling and then storing shelled nuts in inappropriate facilities on the farm can greatly increase moisture levels and facilitate contamination. Inexpensive hand-operated shelling equipment helps to reduce contamination at the processing stage, but much more intervention is needed to remove these toxins from the human food chain, including improved testing, consumer awareness, and market regulations.

A low-cost, portable aflatoxin detection kit developed by the Mchinji National Smallholder Farmers'

Association of Malawi (NASFAM) and the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) reduces the costs of testing from US$ 25 to US$ 1 per sample. The kit enables farmers even in remote locations to monitor toxin levels in groundnuts before and after harvest. As a result, more than 4,000 NASFAM farmers have been able to meet food safety standards and export groundnuts to Europe under fair trade agreements. ICRISAT is now seeking to extend the test kits to other African countries.

Source: Authors, based on SciDevNet 2013, Unnevehr and Grace 2013, and The Guardian 2012.

TABLE 26: PUBLIC AND PRIVATE OPTIONS FOR STRENGTHENING SMALLHOLDER FARMERS' LINKS TO MARKETS

Issue	Public sector		Private sector
	Public investments	Policy environment	
Lack of access to markets	• Invest in education, rural infrastructure (roads, markets, electricity, irrigation). • Support formation of producer organizations.	• Liberalize domestic trade, foster development of input and credit markets.	• Assist farmers in forming producer organizations.
Weak technical capacity	• Support market-oriented extension.	• Foster environment for private extension to emerge.	• Provide extension and key inputs to farmers.
Meeting quality standards	• Support farmer training on good agricultural practices for quality enhancement and food safety.	• Establish grades and standards.	• Supply inputs and train farmers in quality management and food safety.
Meeting contract conditions	• Train firms in contract design and management. • Train farmers in their rights and obligations.	• Foster institutions for dispute resolution. • Strengthen producer organizations.	• Foster trust; develop contracts that are self-enforcing.
Farmers' exposure to risk	• Foster development of commodity and futures exchanges. • Train firms to use market instruments to hedge risk.	• Create enabling environment for insurance market.	• Use contracts that share risks among parties. • Assist farmers to obtain insurance.

Source: World Bank 2007.

India and China offer specific examples of how government and the private sector have facilitated linkages for smallholders.[203] In all of these examples of innovative ways to connect smallholders and modern retailers, aggregation seems to be a prerequisite for reducing transaction costs.[204] The scalability and sustainability of the following measures remains an open question, but they demonstrate that private food retailers are looking at different ways to source produce reliably from smallholder farmers.

- ***Upgrade wholesale markets.*** In China, the Ministry of Commerce matched leading wholesale markets with leading food firms to act as "modernization anchors" to invest in and help upgrade wholesale market infrastructure
- ***Develop rural business hubs.*** In India, private firms have set up rural business hubs typically consisting of small supermarkets with an input retail shop and sometimes procurement facilities for grain, milk, or vegetables. The private firm also invites partners from the banking, insurance, and health sectors to set up "store-in-store"

[203] Reardon (2011).
[204] Reardon (2011).

units. In this way, rural business hubs become a one-stop-shop for farmers and a procurement center for other operators.

- ***Develop integrated, mega food parks.*** In this setup, a private firm is the anchor investor; it invites other investors (processors and retailers), who then invite logistics companies, to co-invest in the park. The public sector can also be an anchor investor or infrastructure facilitator, providing water and electricity to the park (or hub) along with technical assistance for the farmers linking to the hub.
- ***Set up collection centers.*** In India, private retailers have set up collection centers as a procurement unit of the retailer or its dedicated wholesaler in a rural areas; the centers also provide assets and services for small-scale farmers (for example, credit, inputs, or technical advice). In some cases governments by themselves, or in partnership with NGOs, set up physical infrastructure such as a warehouse or collection center in a rural area to facilitate linkages between supermarket chains and individual farmers or cooperatives. Usually this arrangement prevails when retailers cannot or do not want to invest in providing the technical assistance or credit that NGOs offer as part of their mandates.

Even when modern retailers prefer procuring from medium-sized producers, there is some evidence that smallholders may still experience some spillover benefits, such as when medium-sized farmers hire labor from local, small-farm households. China, despite rapid "downstream" restructuring of the food industry, has seen little to no effect transmitted upstream to small-scale farmers, because the transformed food industry continues to rely mainly on traditional wholesale markets.[205]

Foster the growth of effective producer organizations

Fostering the growth of more effective producer organizations provides opportunities to improve links between smallholder farmers and modernizing agri-food systems. Producer organizations have been defined as "structures for mediation between rural producers and others who act in their economic, institutional, and political environment."[206] These organizations can have multiple objectives, such as improving natural resource and asset management (for example, water user associations, herder associations, and community forest associations); helping rural producers expand their access to natural resources; facilitating improved access to services, credit, and markets for rural producers; and providing a platform for advocacy and influencing policies. Producer organizations can be local entities operating in a village or among villages, or they may be regional or national entities. In many countries, producer organizations have organized themselves into federations at the local, regional, and national levels. Usually the function and level of organization are related.

Experience indicates that there is no universal approach to supporting producer organizations. Support must be tailor-made to the specific needs of producer organizations in a given country and must foster learning-by-doing processes that will

[205] Reardon et al. (undated).
[206] Rondot and Collion (2001).

vary according to those needs.[207] Generally speaking, however, programs to support producer organizations should embody a principle of empowerment and allow leaders and members to be responsible for identifying their needs, organizing themselves to access the services corresponding to those needs, and negotiating and contracting with the service providers they select.

Governments and donors play important roles in supporting producer organizations. Only governments can create the enabling environment and legal basis for producers organizations to have a formal identity that is recognized under the law. Relevant donor support may include financing to strengthen the strategic, technical, and financial capacity of producer organizations. Training and other efforts to develop the organization's human resources (its members as well as its leaders) are vital. Neither donors nor governments are well suited to provide the business development and management training that producer organizations need to operate more effectively; those skills are delivered better by private service providers or NGOs with the appropriate capacity. What government and donors can provide, however, is indirect support—for example, through instruments such as demand-driven funds to support producer organizations' developmental needs. Funds of this type are effective for fostering and empowering functional producer organizations.[208] They let producer organizations define their priorities, identify which activities to finance, choose their service providers, and determine the timing and pace of the activities they decide to pursue. In implementing such funds, it is important to advertise them widely and award funds based on clear, transparent criteria and procedures. Demand-driven funds may be managed by an external entity or the producer organization itself, depending on the particular circumstances.

Productive alliances

Aside from producer organizations, several other institutional arrangements are evolving to better link smallholder farmers to markets. One such arrangement is the productive alliance model, which evolved from a World Bank project to support collaborative arrangements between small-scale farmer organizations and agribusinesses in Colombia. The Colombia Productive Partnerships Project (2002–08) supported the development and implementation of partnerships by providing an integrated package of incentives and assistance to producers. Variants of this model are now being implemented in a large number of World Bank projects across Latin America, Africa, South and East Asia, and the Pacific.

Productive alliances have four building blocks: organizing farmers, linking them to markets, investing in production and marketing, and providing technical assistance.[209] The approach addresses several issues in an integrated manner, including smallholders' limited negotiating power, technical knowledge, financial resources, and access to rural credit and to markets. The model is attractive because it combines investment, training, the modern concept of innovation, and access to markets. In productive alliances, the main

[207] Rondot and Collion (2001).
[208] Rondot and Collion (2001).
[209] Jansen (2013).

instrument for forging the links between producers or producer organizations and agribusiness has been competitively allocated matching grants.

Results from the Colombia Productive Partnerships Project highlight the strong potential of this approach to linking smallholder farmers to markets. By its closure in 2008, the project had successfully established 136 productive partnerships with a range of private companies and producers participating in the project. A beneficiary survey at the end of the project indicated that 40–64 percent of respondents saw their productivity, incomes, and product quality improve. These benefits appeared to increase over time. More than 60 percent of those surveyed perceived that the program contributed to improvements in security. Sixty-seven percent perceived that the program had a positive impact on living conditions. An unintended impact was the significant spillover effects of the partnerships to neighboring producers, who replicated technologies introduced through the partnership. The strict competitive rules for grant financing and financial control mechanisms developed under the project were adopted by other government departments and projects.[210]

Contract farming

Contract farming is another avenue for linking small-scale farmers to markets that smallholders normally cannot enter owing to distance, standards, processing requirements, or other factors.[211] Contract farming can bring smallholder farmers a range of benefits, including improvements in productivity and profitability as farmers gain better access to inputs and technical advice and are linked to the market (see Box 10). Experience indicates that contract farming may not be suitable for all farmers, however. Typically problems occur when farmers or buyers renege on their contractual obligations (for example, farmers may engage in side-selling, or buyers may not fulfill commitments to purchase produce); fair pricing models cannot be established; the abuse of power undermines contractual arrangements; the parties cannot comply with quality or performance objectives; and mechanisms for resolving disputes are absent or dysfunctional.[212]

A recent World Bank report concludes that smallholders who have access to assets and capital and regularly produce marketable surpluses are in the best position to benefit from contract farming arrangements. Contract farming may not be suitable for asset-poor smallholder farmers (such as tenant farmers or the near landless) or even for the majority of smallholders, who are largely subsistence farmers who sell surplus only occasionally in the informal market (unless those subsistence farmers are part of an effective producer organization, with requisite management and financial capabilities).[213]

[210] World Bank (2009b).
[211] World Bank (2014a).
[212] World Bank (2014a); Wiggins and Keats (2013).
[213] World Bank (2014a).

BOX 10: CONTRACT FARMING OFFERS MULTIPLE BENEFITS FOR MALAGASY SMALLHOLDERS

In Madagascar, Lecofruit, a local firm, contracted nearly 10,000 Malagasy smallholders to grow high-value horticultural crops for the European market during the lean off-season, when they cannot grow rice and other major crops, and their sources of food and income decline sharply. Lecofruit offered a guaranteed price for the produce (gherkins, French beans, snowpeas, asparagus, and mini-vegetables) and provided inputs such as seed, fertilizer, and technical assistance. The arrangement has increased agricultural productivity, shortened the lean season from 4.5 to less than 2 months, reduced risk, and yielded higher, more stable cash incomes for farmers. The provision of inputs on credit, access to new technologies, and the ability to earn income during the off-season are all major incentives for farmers to participate. Contract farming has also had important positive spillover effects. For example, Lecofruit introduced composting—combining manure with vegetable matter—to improve soil fertility and moisture retention on fields used for the contract crops. Farmers then started using this sustainable practice for all of their other crops, including rice (the major staple), which increased overall agricultural productivity and incomes. The new technologies and practices are expected to yield additional environmental and social benefits over the long term. In particular, increased employment and higher productivity of existing agricultural land will reduce the need to clear forests for agriculture, reduce food prices, and benefit the poor, especially in rural areas.

Source: Authors, based on Minten et al. 2010.

Nor is contract farming suited to all crops and commodities. High-value horticultural crops, some cash crops (such as sugarcane, cotton, oil palm, or rubber), dairy, poultry, and aquaculture are more suited to contract farming than staple crops or other cash crops such as coffee and cocoa. With these considerations taken into account, governments and donors can facilitate contract farming in several ways, which are discussed in the following chapter.

Invest in Rural Health and Education

A lack of investment or uneven investment in rural health and education will place smallholder farmers at a disadvantage in adjusting to rapidly evolving agri-food markets. In the process of structural transformation, investments in education and health also enable the labor force to better adapt to changes and benefit from opportunities. A healthy, educated rural population is in a better position to transition to work outside of agriculture.

CHAPTER 4: POLICY RECOMMENDATIONS

The analysis and lessons from previous chapters have highlighted a number of policy measures to facilitate market access for smallholder farmers in OIC member countries. The main recommendations are summarized here.

Create the Right Enabling Environment and Upgrade Infrastructure

To participate in and benefit from agricultural markets, smallholder farmers need a conducive macroeconomic, trade, investment, and agricultural policy environment. Investments may also be needed in road, port, wharf, and railway systems; power and water supply; telecommunications; physical marketplaces and trading facilities; and pack houses and storage facilities. OIC member countries seeking better ways of connecting smallholder farmers with markets will benefit from systematically analyzing how different policy measures and the availability and quality of infrastructure currently support or hamper market access and linkages and then developing a strategy to improve the enabling environment for smallholder farmers. Where the majority of farmers are smallholders, a separate strategy may not be needed if a sound agricultural strategy already exists. Public investment decisions can then be prioritized in accordance with the priorities set out in the strategy.

Improve Access to Agricultural Finance

OIC member countries can consider a range of innovative models for providing financing and insurance to farmers. The appropriateness of each model may vary depending on the policy environment, the type of crop, and the characteristics of farmers. The many recent experiences with implementing different financing models provide valuable lessons to member countries evaluating new approaches.

Invest in Disseminating Technical and Market Information to Smallholder Farmers

Government has an important role in disseminating technical and market information to smallholders. The dissemination of technical and market information has properties of a public good,[214] because it is both non-excludable and non-rivalrous. The non-excludable nature of technical and marketing information reduces incentives for private firms to provide more than minimal information to farmers. The dissemination of technical and market information also presents a moral hazard: private firms may give farmers only the information and messages that support each firm's commercial aims. Enabling smallholder farmers to explore, learn, and carry out their own value chain analysis and develop their own marketing plans through participatory approaches has proven to be an effective strategy for empowering those farmers and facilitating market linkages. In some instances

[214] Jaffee and Morton (1995).

the government may provide technical and market information directly, but other options include subsidizing or contracting this activity to the private sector and/or NGOs.

Promote Institutional and Organizational Arrangements That Will Reduce Transaction Costs and Facilitate Market Linkages

Linking smallholder farmers to markets involves high transaction costs. Such farmers are usually more geographically dispersed, less specialized, and produce smaller marketable surpluses than other farmers, which adds to the challenge of transmitting information to them about new technologies and consumer preferences. They may have insufficient output to invest individually in transport and essential storage infrastructure. Dispersed smallholders also may face monopolistic competition, in which one or only a few buyers retain most of the bargaining power. Given these circumstances, government has an important role in helping to facilitate collective action by groups of farmers, including fostering the growth of effective ***producer organizations, associations,*** and ***cooperatives*** to reduce transaction costs. Reducing transaction costs is particularly important for transforming agri-food supply chains, because individual smallholders cannot fulfill the volume and quality requirements of modern food chains. Neither donors nor governments are well suited to provide the business development and management training that producer organizations need to operate more effectively; those skills are delivered better by private service providers or NGOs with the appropriate capacity. What government and donors can provide, however, is indirect support—for example, through instruments such as demand-driven funds to support producer organizations' developmental needs.

Aside from producer organizations, other institutional arrangements are evolving to better link smallholder farmers to markets. One promising approach is ***productive alliances,*** which have four building blocks: organizing farmers, linking them to markets, investing in production and marketing, and providing technical assistance. In productive alliances, the main instrument for forging the links between producers or producer organizations and agribusiness has been competitively allocated matching grants.

Contract farming is another avenue for enabling small-scale farmers to enter markets that are normally out of their reach, owing to distance, standards, processing requirements, or other factors. Smallholders who have access to assets and capital and regularly produce marketable surpluses are in the best position to benefit from contract farming arrangements. In contrast, contract farming may not be suitable for asset-poor smallholder farmers or even the majority of smallholders, who are largely subsistence farmers (unless they are part of an effective producer organization, with requisite management and financial capabilities). Government and donors can facilitate contract farming in several ways. An enabling policy environment, a supportive business environment, and stable macroeconomic situation are all important. Enabling policies include those related to competition, employment and labor, environmental issues, health and safety, land, agricultural inputs, and agricultural R&D. The existence of reliable dispute resolution mechanisms is vital to support the development of contract farming. Court processes in many countries can be costly and prone to corruption and delays, whereas alternative dispute resolution mechanisms can offer a more practical, efficient

means of resolving disputes. Government can also support contract farming by investing in public goods, especially critical infrastructure such as roads, electricity, and storage facilities. Government may also have a role in financing the provision of technical support, if it improves access to technical advice for a broader range of commodities than the one for which the farmer has entered into a contractual relationship.

Pay Special Attention to the Inclusion of Female Smallholders

Smallholder farmers who are female are often more likely to be excluded from transforming agri-food supply chains than men due to numerous factors, including lower mobility, less access to training, less access to market information, and less access to productive resources.[215] In some cases where women's traditional production and marketing activities have become more lucrative, men have tended to displace women from those activities. These factors need to be considered carefully (using tools such as a gender-disaggregated value chain analysis) to ensure that women as well as men have equal opportunities to benefit from transforming agri-food supply chains. In many transforming economies, men start migrating to cities for employment, often seasonally. Women are increasingly left with the responsibility for the farm. In that context, strategies to improve smallholders' access to markets will have the greatest impact if they focus particularly on female farmers.

Invest in Rural Health and Education

A lack of investment or uneven investment in rural health and education will place smallholder farmers at a disadvantage in adjusting to rapidly evolving agri-food markets. The technical skills and knowledge that all farmers, particularly smallholders, require to participate effectively in modern agri-food value chains will only increase over time. Training programs to improve farmers' knowledge of production and marketing strategies, comply with grades and quality standards, and ensure that their production practices are sustainable will likely have better outcomes if the farmers who receive such training have basic education, including literacy and numeracy. A World Bank review at the end of the Colombia Productive Partnership Project found that producers' level of education, the presence of an established producer organization, and training in managerial skills for producer organizations were positively correlated with the success of the partnership.[216] As structural transformation proceeds, investments in education and health will enable the labor force to adapt more successfully to changes and benefit from opportunities. A healthy, educated rural population is in a better position to transition to work outside of agriculture where average incomes are often higher.

[215] World Bank (2009a).
[216] World Bank (2009).

Engage in Technical Cooperation

No "silver bullet" exists to link smallholder farmers to markets. The policies and interventions that succeed in forging those links will be shaped by a particular country's current position in the process of structural transformation, its endowments, both natural and man-made, and by where the country is heading. Nevertheless, OIC member countries have much to gain from sharing first-hand experiences with strategies that successfully linked smallholders to markets, as well as strategies that failed. Two particularly important areas for technical cooperation are to better understand how to foster effective producer organizations and how to establish effective platforms for consultation and collaboration across the public sector, agribusiness, producer groups, and innovation-driven agencies. Evidence indicates that it is often easier to form producer organizations than it is to make them financially viable and sustainable. Issues that warrant attention include the identification of appropriate internal governance arrangements and strategies to strengthen the links between producer organizations and national agricultural and research systems and between producer organizations and actors downstream in the value chain. Identifying mechanisms for resolving disputes effectively and building producer organizations' capacity to use those mechanisms will also have strong payoffs. Platforms for consultation and collaboration can provide many benefits as they link the public and private sectors, producer organizations, and other stakeholders to facilitate knowledge sharing and address policy and other shared issues related to a particular commodity.

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ANNEX OF TABLES

Annex of Tables

TABLE 1.1 ECONOMIC TRANSFORMATION MATRIX DATA, 2011

Group	Country	Agriculture Employment, as % of Total	Agriculture sector VA, as % of Total GDP
Agriculture based			
	Afghanistan	59.4%	30.9%
	Benin	43.3%	34.7%
	Burkina Faso	92.0%	40.2%
	Gambia	75.7%	30.3%
	Guinea-Bissau	79.0%	45.7%
	Mali	74.3%	39.6%
	Mauritania	50.1%	26.3%
	Mozambique	80.3%	27.1%
	Niger	82.6%	47.7%
	Nigeria	60.0%	33.3%
	Sierra Leone	59.5%	54.5%
	Somalia	65.1%	60.4%
	Sudan	50.6%	33.9%
	Togo	52.8%	46.9%
Transition 1 (T1)			
	Chad	64.5%	22.0%
	Guinea	79.3%	20.4%
	Senegal	69.9%	14.6%
	Uganda	74.2%	20.2%
Transition 2 (T2)			
	Albania	41.1%	19.2%
	Bangladesh	44.4%	18.0%
	Cameroon	46.4%	22.7%
	Cote d'Ivoire	36.9%	25.8%
	Gabon	25.2%	4.0%
	Indonesia	40.8%	11.5%
	Oman	28.3%	1.3%
	Pakistan	38.6%	20.3%
	Tajikistan	26.9%	24.3%
	Turkey	31.7%	9.0%
	Turkmenistan	29.3%	12.0%
	Yemen, Rep.	37.8%	10.8%

Group	Country	Agriculture Employment, as % of Total	Agriculture sector VA, as % of Total GDP
Urbanizing			
	Algeria	20.9%	7.9%
	Azerbaijan	22.4%	5.6%
	Egypt, Arab Rep.	24.5%	12.6%
	Guyana	14.2%	23.2%
	Iran, Islamic Rep.	21.2%	8.3%
	Kazakhstan	13.6%	7.0%
	Kyrgyz Republic	20.4%	26.7%
	Malaysia	12.2%	7.8%
	Morocco	24.8%	15.4%
	Syrian Arab Republic	19.6%	15.6%
	Tunisia	20.2%	9.4%
	Uzbekistan	20.9%	26.8%
Urban			
	Bahrain	0.6%	0.3%
	Iraq	5.2%	4.2%
	Jordan	6.1%	3.4%
	Kuwait	1.0%	0.2%
	Lebanon	1.7%	4.2%
	Libya	2.8%	1.7%
	Qatar	0.7%	0.1%
	Saudi Arabia	4.8%	2.8%
	United Arab Emirates	3.0%	0.9%

Source: World Bank, forthcoming

TABLE 1.2 RURAL POPULATION

Country	1970		1980		1990		2000		2010	
	Rural population	as % of total population	Rural population	as % of total population	Rural population	as % of total population	Rural population	as % of total population	Rural population	as % of total population
Afghanistan	9,800,488	89.0	11,114,398	84.3	9,601,160	81.8	16,356,217	79.4	21,798,444	76.8
Albania	1,460,058	68.3	1,811,461	66.2	2,191,252	63.6	1,925,430	58.3	1,501,925	47.7
Algeria	8,887,967	60.5	10,995,311	56.5	12,572,756	47.9	12,438,148	39.2	10,368,695	28.0
Azerbaijan	2,588,666	50.0	2,910,821	47.2	3,311,109	46.3	3,912,746	48.6	4,219,228	46.6
Bahrain	34,576	16.2	50,023	13.9	58,819	11.9	77,703	11.6	142,447	11.4
Bangladesh	61,274,030	92.4	70,246,597	85.1	86,111,637	80.2	101,154,053	76.4	108,970,535	72.1
Benin	2,422,433	83.3	2,701,553	72.7	3,276,583	65.5	4,285,466	61.7	5,300,952	55.7
Brunei Darussalam	49,715	38.3	77,432	40.1	87,785	34.2	95,678	28.8	97,751	24.4
Burkina Faso	5,301,408	94.3	6,222,089	91.2	7,593,789	86.2	9,536,622	82.2	11,551,559	74.3
Djibouti	61,030	38.2	100,244	27.9	143,646	24.4	169,647	23.5	191,837	23.0
Chad	3,223,268	88.4	3,664,946	81.2	4,712,992	79.2	6,513,581	78.5	9,172,800	78.3
Cote d'Ivoire	3,765,634	71.8	5,221,430	63.2	7,348,842	60.7	9,107,589	56.5	9,382,594	49.4
Gabon	400,632	68.0	329,214	45.3	292,124	30.9	243,782	19.9	220,392	14.2
Gambia, The	360,081	80.5	432,645	71.6	565,562	61.7	628,932	51.2	728,457	43.3
Guinea	3,536,697	84.0	3,433,782	76.4	4,332,916	72.0	6,032,817	69.0	7,072,902	65.0
Guinea-Bissau	579,620	84.9	674,222	82.4	731,184	71.9	816,817	64.1	900,885	56.8
Guyana	508,716	70.6	540,057	69.5	510,554	70.4	530,852	71.3	563,566	71.7
Cameroon	5,396,461	79.7	6,080,899	68.1	7,283,617	60.3	8,673,914	54.5	10,000,331	48.5
Iraq	4,348,638	43.8	4,707,541	34.5	5,306,758	30.3	7,656,832	32.2	10,361,251	33.5
Iran, Islamic Rep.	16,817,239	58.8	19,564,151	50.3	24,613,228	43.7	23,700,296	36.0	23,129,484	31.1
Kazakhstan	6,524,056	49.8	6,832,077	45.9	7,149,634	43.7	6,589,130	44.3	7,551,669	46.3
Kyrgyz Republic	1,850,944	62.5	2,220,107	61.4	2,732,336	62.2	3,169,363	64.7	3,524,573	64.7
Comoros	187,015	80.6	240,796	76.8	297,750	72.1	379,962	71.9	492,023	72.0
Kuwait	107,603	14.3	71,578	5.2	41,731	2.0	36,028	1.9	52,592	1.8
Lebanon	931,023	40.5	685,922	26.3	456,270	16.9	452,953	14.0	558,438	12.9
Libya	1,044,654	50.3	920,583	29.9	1,034,154	24.3	1,224,789	23.7	1,355,332	22.4
Maldives	100,574	88.1	119,981	77.8	160,081	74.2	197,178	72.3	195,436	60.0
Malaysia	7,259,260	66.5	8,017,482	58.0	9,143,063	50.2	8,905,272	38.0	7,915,537	28.0
Mali	4,897,149	85.7	5,490,304	81.5	6,106,687	76.7	7,379,612	71.9	9,191,993	65.7
Mauritania	981,605	85.4	1,114,231	72.6	1,221,157	60.3	1,625,155	60.0	2,121,256	58.8
Egypt, Arab Rep.	21,002,560	57.8	25,225,707	56.1	31,842,581	56.5	37,832,114	57.2	44,210,368	56.6
Mozambique	8,906,970	94.2	10,550,075	86.9	10,705,662	78.9	12,957,779	70.9	16,547,479	69.0

Country	1970		1980		1990		2000		2010	
	Rural population	as % of total population	Rural population	as % of total population	Rural population	as % of total population	Rural population	as % of total population	Rural population	as % of total population
Niger	4,024,591	91.2	5,049,950	86.6	6,562,287	84.6	9,211,004	83.8	13,093,904	82.4
Nigeria	43,386,548	77.3	52,633,708	71.4	61,881,637	64.7	70,837,204	57.6	81,449,371	51.0
Oman	509,120	70.3	605,331	52.4	613,589	33.9	623,360	28.4	751,478	26.8
Indonesia	94,594,529	82.9	113,334,358	77.9	124,000,049	69.4	121,180,266	58.0	120,521,157	50.1
Morocco	10,428,894	65.5	11,639,657	58.8	12,734,507	51.6	13,397,579	46.7	13,708,736	43.3
United Arab Emirates	51,629	22.3	195,760	19.3	378,443	20.9	598,128	19.8	1,347,100	16.0
Uganda	8,816,541	93.3	11,604,279	92.5	15,592,680	88.9	21,342,658	87.9	28,835,431	84.8
Uzbekistan	7,577,229	63.3	9,490,758	59.2	12,270,723	59.8	15,424,002	62.6	18,221,669	63.8
Qatar	12,703	11.6	23,801	10.6	34,376	7.2	21,901	3.7	23,534	1.3
Senegal	2,952,639	70.0	3,576,965	64.2	4,591,121	61.1	5,882,985	59.7	7,478,692	57.7
Saudi Arabia	2,978,721	51.3	3,360,491	34.1	3,794,977	23.4	4,059,537	20.2	4,883,613	17.9
Syrian Arab Republic	3,613,910	56.7	4,772,915	53.3	6,358,876	51.1	7,866,857	48.1	9,544,776	44.3
Somalia	2,664,068	77.3	4,459,919	73.2	4,446,750	70.3	4,929,987	66.8	6,042,940	62.7
Sierra Leone	1,939,415	76.6	2,254,629	70.9	2,707,301	67.0	2,656,606	64.2	3,515,838	61.1
Suriname	201,242	54.1	164,527	45.0	162,600	40.0	164,034	35.2	161,026	30.7
Pakistan	44,511,503	75.2	57,535,904	71.9	77,123,732	69.4	96,168,961	66.9	111,019,872	64.1
Tajikistan	1,842,959	63.1	2,574,322	65.7	3,620,271	68.3	4,547,626	73.5	5,606,085	73.5
Togo	1,665,338	78.7	2,049,798	75.3	2,704,764	71.4	3,263,909	67.1	3,939,178	62.5
Jordan	663,957	44.0	873,730	40.1	880,341	27.8	968,610	20.2	1,059,682	17.5
Tunisia	2,897,678	56.5	3,155,675	49.4	3,429,251	42.1	3,497,181	36.6	3,576,356	33.9
Turkmenistan	1,142,834	52.2	1,514,098	52.9	2,014,649	54.9	2,434,682	54.1	2,601,165	51.6
Yemen, Rep.	5,285,730	86.7	6,599,637	83.5	9,322,432	79.1	12,919,892	73.7	15,537,574	68.3

Source: WDI database

TABLE 1.3 GDP PER CAPITA (CURRENT USD)

Country	1970	1980	1990	2000	2010
Afghanistan	158.8	276.3	..	..	561.2
Albania	..	..	609.7	1,115.5	3,764.3
Algeria	331.1	2,174.3	2,364.5	1,727.3	4,349.6
Azerbaijan	..	..	1,237.3	655.1	5,843.2
Bahrain	..	8,537.6	8,528.8	13,562.7	20,546.0
Bangladesh	135.6	219.9	284.0	356.0	664.1
Benin	114.7	378.0	391.9	339.5	689.6
Brunei Darussalam	1,380.5	25,531.5	13,702.4	18,086.6	30,880.3
Burkina Faso	81.5	282.7	352.0	224.9	592.6
Djibouti	..	..	766.8	762.5	..
Chad	128.7	228.9	292.1	166.9	909.3
Cote d'Ivoire	277.7	1,231.1	891.1	645.8	1,207.8
Gabon	549.6	5,891.1	6,287.4	4,135.3	9,322.0
Gambia, The	116.9	398.9	345.9	637.1	566.3
Guinea	..	..	443.0	342.5	435.4
Guinea-Bissau	115.3	135.2	239.8	284.2	526.5
Guyana	371.5	776.4	547.0	957.3	2,874.0
Cameroon	171.3	754.7	923.9	583.1	1,090.6
Iraq	..	..	..	..	4,612.5
Iran, Islamic Rep.	370.1	2,315.3	2,058.8	1,536.7	5,674.9
Kazakhstan	..	..	1,647.5	1,229.0	9,071.0
Kyrgyz Republic	..	..	608.9	279.6	880.0
Comoros	..	393.8	605.7	382.2	795.5
Kuwait	3,829.4	20,881.5	8,946.5	19,786.7	40,090.7
Lebanon	..	..	1,050.1	5,334.9	8,551.9
Libya	..	..	6,785.5	6,548.6	..
Maldives	..	275.2	996.4	2,289.1	6,552.5
Malaysia	392.0	1,802.6	2,417.4	4,004.5	8,754.2
Mali	62.9	265.4	304.0	236.1	673.7
Mauritania	182.2	462.2	503.7	477.7	1,017.2
Egypt, Arab Rep.	211.4	509.9	765.6	1,509.6	2,803.5
Mozambique	..	290.4	185.2	235.8	387.0
Niger	147.3	430.0	319.9	163.6	359.8
Nigeria	223.5	871.1	321.7	377.5	2,293.9
Oman	354.1	5,181.8	6,455.5	9,061.6	20,983.9
Indonesia	84.7	536.2	640.6	789.8	2,946.7
Morocco	247.4	943.4	1,037.3	1,275.9	2,822.7
United Arab Emirate	..	42,961.8	28,066.1	34,476.3	34,048.5
Uganda	133.3	99.2	245.5	255.1	471.7
Uzbekistan	..	..	651.4	558.2	1,377.1

Country	1970	1980	1990	2000	2010
Qatar	2,760.1	34,990.1	15,446.3	29,914.3	72,773.3
Senegal	243.0	629.1	760.8	474.5	998.6
Saudi Arabia	864.1	16,692.4	7,205.8	9,354.5	19,326.6
Syrian Arab Republi	335.5	1,458.5	988.5	1,180.5	..
Somalia	91.8	99.1	145.1	..	..
Sierra Leone	171.6	346.1	160.7	153.6	447.8
Suriname	663.8	2,174.1	954.6	1,911.8	8,320.6
Pakistan	169.4	296.2	360.2	514.2	1,024.6
Tajikistan	..	..	496.4	139.1	739.7
Togo	120.1	417.7	429.9	266.0	503.2
Jordan	424.1	1,792.6	1,312.3	1,763.2	4,370.7
Tunisia	280.7	1,369.5	1,507.2	2,245.3	4,206.8
Turkmenistan	..	..	881.2	645.3	4,392.7
Yemen, Rep.	..	..	479.0	549.9	1,363.7

Source: WDI database

TABLE 1.4 AGRICULTURE VALUE ADDED (% OF GDP)

Country	1970	1980	1990	2000	2010
Afghanistan	..	..	..	..	27.1
Albania	..	33.6	35.9	29.1	19.1
Algeria	9.2	8.5	11.4	8.9	8.6
Azerbaijan	..	..	29.0	17.1	5.9
Bahrain	..	1.0	0.9	..	..
Bangladesh	..	31.6	30.3	25.5	18.6
Benin	36.3	35.4	34.7	34.9	32.4
Brunei Darussalam	..	0.6	1.0	1.0	0.8
Burkina Faso	31.4	29.4	29.1	29.3	35.4
Djibouti	..	..	3.1	3.5	..
Chad	39.7	45.1	29.3	42.3	53.4
Cote d'Ivoire	31.9	25.9	32.5	24.2	..
Gabon	18.5	6.8	7.3	6.2	4.1
Gambia, The	30.2	27.0	24.3	24.5	29.0
Guinea	..	..	23.8	22.4	22.0
Guinea-Bissau	47.5	44.3	60.8	..	..
Guyana	19.2	23.4	38.1	31.1	21.0
Cameroon	31.4	31.3	24.6	22.1	..
Iraq	..	..	..	..	..
Iran, Islamic Rep.	20.0	16.5	19.1	13.7	..
Kazakhstan	..	..	..	8.7	4.8
Kyrgyz Republic	..	..	33.5	36.7	19.4
Comoros	..	34.0	41.4	48.6	..
Kuwait	0.3	0.2	0.6	0.4	..
Lebanon	..	..	..	7.1	5.6
Libya	..	..	..	..	..
Maldives	..	..	..	8.8	4.3
Malaysia	29.4	22.6	15.2	8.6	10.4
Mali	66.0	48.3	45.5	41.6	40.6
Mauritania	29.3	30.4	29.6	36.7	17.3
Egypt, Arab Rep.	29.4	18.3	19.4	16.7	14.0
Mozambique	..	37.1	37.1	24.0	30.3
Niger	64.9	43.1	35.3	37.8	40.9
Nigeria	..	..	31.5	26.0	24.0
Oman	15.5	2.5	2.6	2.0	..
Indonesia	44.9	24.0	19.4	15.6	15.3
Morocco	..	18.5	18.3	14.9	15.4
United Arab Emirate	..	0.5	1.1	2.3	0.9
Uganda	53.8	72.0	56.6	29.4	25.7

Country	1970	1980	1990	2000	2010
Uzbekistan	..	..	32.8	34.4	19.1
Qatar	..	..	..	..	..
Senegal	..	20.1	19.9	19.1	17.7
Saudi Arabia	4.5	1.0	5.7	4.9	2.4
Syrian Arab Republi	..	..	29.8	23.8	..
Somalia	59.4	68.4	65.5	..	..
Sierra Leone	29.6	33.0	46.9	58.4	56.1
Suriname	7.3	9.1	8.7	11.2	10.4
Pakistan	36.8	29.5	26.0	25.9	24.3
Tajikistan	..	..	33.3	27.4	22.1
Togo	33.8	27.5	33.8	35.1	31.0
Jordan	11.6	7.9	7.7	2.3	3.4
Tunisia	19.7	16.3	17.7	11.3	8.0
Turkmenistan	..	..	32.2	24.4	14.5
Yemen, Rep.	..	..	24.4	13.8	7.7

Source: WDI database

TABLE 1.5 AGRICULTURE VALUE ADDED PER WORKER (CONSTANT 2005 US$)

Country	1980	1990	2000	2010
Afghanistan	..	..	..	400.5
Albania	1,218.3	1,234.2	2,486.3	3,301.8
Algeria	1,801.8	2,036.5	2,025.1	3,385.1
Azerbaijan	..	..	884.7	1,245.4
Bahrain	..	..	..	..
Bangladesh	238.9	244.3	324.2	450.2
Benin	589.6	639.9	865.5	1,041.2
Brunei Darussalam	..	21,093.3	64,178.0	80,205.7
Burkina Faso	196.4	197.4	265.2	334.4
Djibouti	..	107.6	81.3	..
Chad	..	..	..	1,285.4
Cote d'Ivoire	1,150.1	931.8	1,213.1	..
Gabon	1,525.7	1,572.4	1,966.9	2,359.0
Gambia, The	447.4	307.3	330.6	366.7
Guinea	..	150.0	164.9	201.3
Guinea-Bissau	..	..	..	..
Guyana	2,478.2	2,525.1	4,504.2	4,472.3
Cameroon	516.6	539.7	760.2	..
Iraq	..	..	4,968.3	6,260.9
Iran, Islamic Rep.	1,538.0	2,122.2	2,557.7	..
Kazakhstan	..	..	2,084.4	3,307.4
Kyrgyz Republic	..	..	1,133.3	1,311.0
Comoros	812.3	928.0	958.4	..
Kuwait	..	..	..	..
Lebanon	..	..	22,541.5	41,416.7
Libya	..	..	..	..
Maldives	..	..	..	2,902.7
Malaysia	3,311.2	4,811.7	5,485.2	8,397.1
Mali	553.8	597.5	581.1	845.5
Mauritania	1,367.8	1,591.9	1,010.5	1,052.8
Egypt, Arab Rep.	935.2	1,210.5	1,676.8	2,237.1
Mozambique	..	166.7	158.2	272.8
Niger	..	..	..	..
Nigeria	..	1,044.2	1,489.0	4,063.1
Oman	..	..	..	..
Indonesia	559.9	613.4	661.6	909.8
Morocco	1,498.6	2,060.5	1,662.3	3,779.7
United Arab Emirate	..	..	..	12,126.6
Uganda	..	204.5	219.5	220.3

Country	1980	1990	2000	2010
Uzbekistan	..	..	989.2	1,757.7
Qatar	..	..	..	..
Senegal	420.0	399.8	411.9	410.8
Saudi Arabia	2,709.6	8,297.6	14,933.4	21,440.6
Syrian Arab Republi	..	..	..	..
Somalia	..	..	..	..
Sierra Leone	443.7	733.0	748.0	847.6
Suriname	3,212.7	2,938.9	2,768.6	3,630.7
Pakistan	652.8	857.1	1,063.7	1,048.4
Tajikistan	..	..	518.0	905.3
Togo	487.3	582.1	635.8	543.8
Jordan	1,958.5	2,539.7	1,857.7	4,568.5
Tunisia	1,946.6	3,030.3	3,614.5	3,879.1
Turkmenistan	..	..	1,354.2	..
Yemen, Rep.	..	769.5	871.1	928.6

Source: WDI database

TABLE 1.6 AGRICULTURE VALUE ADDED (CURRENT US$)

Country	1970	1980	1990	2000	2010
Afghanistan	..	..	..	..	4,156,034,930
Albania	..	..	754,499,968	954,446,957	1,931,362,608
Algeria	471,495,321	3,361,563,368	6,441,169,744	4,600,053,216	13,648,522,941
Azerbaijan	..	..	2,348,640,482	848,115,691	2,933,408,086
Bahrain	..	30,246,751	40,155,321	..	..
Bangladesh	4,906,563,907	5,580,038,760	8,970,425,116	11,601,291,990	18,040,057,496
Benin	121,199,783	497,918,508	679,224,914	823,816,205	2,127,624,395
Brunei Darussalam	..	31,290,865	34,013,523	61,476,601	93,988,706
Burkina Faso	139,867,714	548,650,312	866,814,259	717,120,787	2,987,488,655
Djibouti	..	..	12,086,361	17,060,454	..
Chad	174,106,503	472,414,358	484,875,099	563,789,247	5,536,211,300
Cote d'Ivoire	463,815,284	2,633,477,638	3,508,481,693	2,522,555,968	..
Gabon	60,057,242	289,190,357	435,972,646	314,898,134	591,630,661
Gambia, The	15,816,025	65,137,198	77,186,270	192,066,658	275,573,961
Guinea	..	..	658,359,456	628,481,584	958,870,831
Guinea-Bissau	37,363,407	46,690,734	138,902,319	..	..
Guyana	45,050,000	124,800,000	133,189,878	184,191,209	414,101,971
Cameroon	363,822,204	1,933,032,522	2,675,806,850	1,900,966,236	..
Iraq	..	..	..	..	7,150,625,983
Iran, Islamic Rep.	1,980,819,328	14,498,505,863	21,657,314,112	13,805,773,736	..
Kazakhstan	..	..	..	1,483,623,827	6,779,960,119
Kyrgyz Republic	..	..	873,750,000	468,264,696	836,721,810
Comoros	..	42,006,312	103,565,500	98,029,666	..
Kuwait	8,119,996	51,794,879	113,541,672	133,985,330	..
Lebanon	..	..	..	1,076,616,915	1,757,877,280
Libya	..	..	..	..	..
Maldives	..	..	..	54,697,885	92,187,500
Malaysia	1,258,957,897	5,638,925,369	6,698,953,685	8,065,000,000	25,647,864,273
Mali	208,051,914	779,322,947	1,067,409,480	937,531,241	3,428,000,747
Mauritania	57,592,553	202,225,461	270,751,394	444,577,759	572,438,037
Egypt, Arab Rep.	1,941,723,240	3,992,638,775	7,956,482,430	15,512,989,412	29,201,295,898
Mozambique	..	1,195,453,761	856,717,683	899,966,704	2,627,471,257
Niger	421,634,135	1,080,085,601	874,516,336	680,500,204	2,338,810,301
Nigeria	..	..	9,213,962,202	11,730,002,753	86,420,358,484
Oman	39,839,991	152,287,201	302,210,666	388,448,898	..
Indonesia	4,339,972,752	18,701,255,165	22,210,643,985	25,746,530,861	108,407,428,322
Morocco	788,854,856	3,468,322,918	4,570,959,218	4,916,337,286	12,570,158,660
United Arab Emirate	..	213,896,526	536,638,518	2,360,789,720	2,448,468,416
Uganda	642,727,166	893,170,000	2,293,509,208	1,703,706,836	3,786,307,410

Country	1970	1980	1990	2000	2010
Uzbekistan	..	..	4,424,230,636	4,135,846,824	6,927,018,179
Qatar	..	..	..	..	..
Senegal	230,835,452	626,534,656	1,023,775,012	789,029,586	2,005,262,947
Saudi Arabia	227,777,778	1,622,929,663	6,713,484,749	9,326,133,248	12,550,133,333
Syrian Arab Republi	..	..	3,481,513,883	4,665,815,365	..
Somalia	166,627,944	388,485,446	575,395,430	..	..
Sierra Leone	112,920,045	334,349,400	286,029,665	349,820,754	1,364,876,203
Suriname	17,800,000	61,350,000	31,400,000	90,661,364	423,615,116
Pakistan	3,352,372,947	6,279,192,239	9,227,317,618	17,851,828,944	41,303,135,855
Tajikistan	..	..	875,803,339	216,215,239	1,105,123,735
Togo	85,744,326	312,382,326	549,661,318	454,814,066	984,642,571
Jordan	68,879,972	279,264,916	286,268,743	170,513,977	789,936,500
Tunisia	245,142,857	1,235,461,168	1,932,159,091	2,148,683,155	3,251,502,026
Turkmenistan	..	..	1,041,916,283	654,675,248	3,176,786,845
Yemen, Rep.	..	..	1,376,832,061	1,326,716,878	2,390,373,584

Source: WDI database

TABLE 1.7 AGRICULTURE RAW MATERIALS EXPORTS (% OF MERCHANDISE EXPORTS)

Country	1970	1980	1990	2000	2010
Afghanistan	35.8	..	..	..	10.8
Albania	..	..	..	5.9	2.4
Algeria	0.5	0.0	0.0	0.0	0.0
Azerbaijan	..	..	..	2.4	0.1
Bahrain	0.1	0.2	0.2	0.0	0.0
Bangladesh	..	18.7	6.8	1.4	..
Benin	18.3	25.0	..	71.9	23.6
Brunei Darussalam	0.3	0.0	0.0	..	..
Burkina Faso	27.6	47.7	..	59.2	55.9
Djibouti	..	..	4.7	..	..
Chad	71.2	..	..	..	..
Cote d'Ivoire	24.6	..	..	14.0	9.6
Gabon	33.0	..	..	11.8	..
Gambia, The	0.2	0.4	..	1.2	1.5
Guinea	..	..	..	3.0	..
Guinea-Bissau	4.3	..	..	..	..
Guyana	1.4	..	..	3.9	5.3
Cameroon	29.2	15.7	14.3	9.1	14.8
Iraq	..	..	..	0.2	..
Iran, Islamic Rep.	3.6	..	..	0.4	0.3
Kazakhstan	..	..	..	1.5	0.2
Kyrgyz Republic	..	..	..	14.2	5.3
Comoros	..	..	..	0.0	..
Kuwait	0.1	0.1	0.1	0.0	..
Lebanon	6.0	..	..	1.9	0.7
Libya	0.0	..	..	..	0.0
Maldives	..	..	..	0.0	..
Malaysia	50.0	31.0	13.8	2.6	2.6
Mali	23.9	68.6	62.3	90.8	48.0
Mauritania	2.5	..	..	0.0	0.1
Egypt, Arab Rep.	46.3	15.6	9.5	5.0	3.0
Mozambique	..	..	..	11.3	4.4
Niger	4.8	..	..	3.3	2.8
Nigeria	5.1	..	..	0.0	1.6
Oman	..	0.0	0.0	0.0	0.0
Indonesia	34.8	14.1	5.0	3.6	6.5
Morocco	5.5	2.6	2.9	2.0	1.7
United Arab Emirat	..	..	..	0.0	..
Uganda	..	..	..	15.0	7.2

Country	1970	1980	1990	2000	2010
Uzbekistan	..	..	..	..	..
Qatar	..	..	0.0	0.0	0.0
Senegal	4.1	3.1	2.7	1.7	1.4
Saudi Arabia	..	0.0	0.0	0.1	0.0
Syrian Arab Republ	..	9.1	4.5	4.6	1.7
Somalia	8.2	7.7	..	..	..
Sierra Leone	..	..	..	0.7	..
Suriname	..	..	0.0	0.1	0.5
Pakistan	30.2	20.5	10.2	3.0	1.8
Tajikistan	..	..	..	12.6	..
Togo	2.2	2.5	21.5	23.4	4.6
Jordan	2.1	0.5	0.4	0.5	0.2
Tunisia	4.7	0.9	1.0	0.7	0.5
Turkmenistan	..	..	..	9.9	..
Yemen, Rep.	..	..	..	0.4	0.3

Source: WDI database

TABLE 1.8 AGRICULTURE RAW MATERIALS IMPORTS (% OF MERCHANDISE IMPORTS)

Country	1970	1980	1990	2000	2010
Afghanistan	1.5	..	..	..	..
Albania	..	..	..	0.9	1.0
Algeria	3.8	3.2	4.7	2.6	1.6
Azerbaijan	..	..	..	1.7	1.7
Bahrain	1.2	1.2	0.9	0.8	0.5
Bangladesh	..	5.9	5.4	6.1	..
Benin	1.8	1.4	..	5.3	3.6
Brunei Darussalan	0.3	0.2	0.4	..	..
Burkina Faso	4.8	1.6	..	0.6	0.7
Djibouti	..	1.2	11.4	..	..
Chad	1.9	..	..	..	..
Cote d'Ivoire	0.6	..	..	1.1	0.9
Gabon	0.3	0.5	..	0.5	..
Gambia, The	1.8	1.0	..	0.7	0.7
Guinea	..	..	..	1.2	..
Guinea-Bissau	0.1	..	..	..	..
Guyana	0.4	..	..	0.5	0.5
Cameroon	0.8	0.4	0.5	1.6	1.6
Iraq	..	..	..	0.1	..
Iran, Islamic Rep.	5.7	..	..	2.6	2.4
Kazakhstan	..	..	..	0.9	0.6
Kyrgyz Republic	..	..	..	1.8	1.2
Comoros	..	..	..	0.9	..
Kuwait	1.1	1.0	0.9	0.4	..
Lebanon	6.3	..	..	1.8	1.1
Libya	1.4	1.3	..	..	0.8
Maldives	..	..	..	1.8	2.2
Malaysia	2.1	1.9	1.4	1.3	2.0
Mali	4.1	0.3	0.6	0.9	0.5
Mauritania	0.8	..	..	0.3	0.5
Egypt, Arab Rep.	8.3	6.2	7.1	4.8	3.2
Mozambique	..	..	..	1.3	1.0
Niger	2.3	..	..	3.8	2.1
Nigeria	0.8	..	..	0.9	0.8
Oman	..	1.5	0.8	0.7	0.6
Indonesia	1.2	3.5	4.7	7.2	3.1
Morocco	8.1	6.5	6.1	3.1	2.2
United Arab Emira	..	1.4	..	0.8	..
Uganda	..	..	..	2.1	1.1

Country	1970	1980	1990	2000	2010
Uzbekistan	..	..	..	..	..
Qatar	..	1.1	0.7	0.6	0.5
Senegal	3.1	0.9	1.8	2.1	1.5
Saudi Arabia	..	1.3	0.7	1.0	0.9
Syrian Arab Repub	..	3.3	1.9	3.3	2.3
Somalia	5.5	4.2	..	..	..
Sierra Leone	..	..	..	3.6	..
Suriname	..	..	0.2	0.0	0.1
Pakistan	3.6	3.4	4.0	3.3	4.9
Tajikistan	..	..	..	0.7	..
Togo	2.3	1.4	1.2	1.7	1.4
Jordan	3.0	1.5	1.4	2.3	1.3
Tunisia	5.5	3.6	4.3	3.1	2.1
Turkmenistan	..	..	..	0.4	..
Yemen, Rep.	..	..	..	1.5	0.8

Source: WDI database

TABLE 1.9 FOOD EXPORTS (% OF MERCHANDISE EXPORTS)

Country	1970	1980	1990	2000	2010
Afghanistan	36.1	..	..	..	40.0
Albania	..	..	..	6.6	4.5
Algeria	20.0	0.8	0.4	0.2	0.6
Azerbaijan	..	..	..	3.2	2.8
Bahrain	5.2	8.7	2.8	0.6	1.9
Bangladesh	..	12.5	14.3	7.6	..
Benin	70.9	61.8	..	20.7	60.8
Brunei Darussalam	0.3	0.0	0.0	..	..
Burkina Faso	67.9	41.3	..	19.1	33.3
Djibouti	..	..	39.1	..	..
Chad	22.6	..	..	..	..
Cote d'Ivoire	67.7	..	..	50.3	49.5
Gabon	1.8	..	..	0.8	..
Gambia, The	99.8	98.9	..	80.9	77.5
Guinea	..	..	..	3.1	..
Guinea-Bissau	93.6	..	..	..	..
Guyana	42.0	..	..	59.2	64.8
Cameroon	75.0	48.0	20.4	14.9	24.4
Iraq	..	..	..	0.5	..
Iran, Islamic Rep.	2.6	..	..	2.9	6.2
Kazakhstan	..	..	..	7.1	3.4
Kyrgyz Republic	..	..	..	17.0	30.0
Comoros	..	..	..	88.3	..
Kuwait	1.0	0.5	0.7	0.1	..
Lebanon	30.0	..	..	19.7	14.9
Libya	0.0	..	..	..	0.0
Maldives	..	..	..	53.7	96.2
Malaysia	12.6	15.0	11.7	5.5	11.9
Mali	64.8	30.1	36.1	4.1	29.8
Mauritania	8.3	..	..	20.8	57.8
Egypt, Arab Rep.	21.3	6.8	9.7	7.9	17.2
Mozambique	..	..	..	41.7	15.7
Niger	91.3	..	..	43.5	21.1
Nigeria	31.3	..	..	0.1	3.3
Oman	..	0.8	1.5	3.6	2.5
Indonesia	19.6	7.6	11.2	8.9	16.4
Morocco	51.8	28.5	26.1	21.5	19.0
United Arab Emirates	..	..	..	0.6	..
Uganda	..	..	..	71.2	66.8

Country	1970	1980	1990	2000	2010
Uzbekistan	..	..	..	..	..
Qatar	..	..	0.0	0.0	0.0
Senegal	64.8	43.0	53.2	52.4	28.6
Saudi Arabia	..	0.1	0.7	0.6	1.2
Syrian Arab Republic	..	4.3	13.7	8.8	21.0
Somalia	85.5	86.7	..	..	..
Sierra Leone	..	..	..	18.9	..
Suriname	..	..	16.0	2.4	2.4
Pakistan	10.6	23.5	9.3	10.5	16.8
Tajikistan	..	..	..	4.4	..
Togo	67.2	20.7	23.0	19.6	14.2
Jordan	57.4	25.0	10.6	15.9	16.6
Tunisia	29.9	7.2	11.0	8.7	7.7
Turkmenistan	..	..	..	0.3	..
Yemen, Rep.	..	..	..	2.2	6.6

Source: WDI database

TABLE 1.10 FOOD IMPORTS (% OF MERCHANDISE IMPORTS)

Country	1970	1980	1990	2000	2010
Afghanistan	20.5	..	..	..	13.7
Albania	..	..	..	21.8	17.9
Algeria	12.7	21.0	23.7	28.2	16.3
Azerbaijan	..	..	..	18.6	18.5
Bahrain	20.4	16.7	16.5	9.7	7.6
Bangladesh	..	23.6	19.0	16.5	..
Benin	17.8	26.3	..	21.9	31.9
Brunei Darussalam	17.2	15.2	19.2	..	..
Burkina Faso	20.4	20.5	..	12.6	15.1
Djibouti	..	42.7	29.9	..	..
Chad	20.6	..	..	..	..
Cote d'Ivoire	15.9	..	..	17.2	19.2
Gabon	14.3	19.1	..	18.2	..
Gambia, The	31.7	25.9	..	34.5	35.2
Guinea	..	..	..	24.2	..
Guinea-Bissau	31.1	..	..	..	..
Guyana	15.9	..	..	13.9	14.8
Cameroon	19.7	8.6	18.5	18.2	17.7
Iraq	..	..	..	1.2	..
Iran, Islamic Rep.	6.5	..	..	19.0	15.4
Kazakhstan	..	..	..	9.3	9.5
Kyrgyz Republic	..	..	..	14.6	16.9
Comoros	..	..	..	43.4	..
Kuwait	19.8	14.8	17.1	14.0	..
Lebanon	25.1	..	..	18.9	16.3
Libya	22.6	19.3	..	..	12.1
Maldives	..	..	..	23.6	22.4
Malaysia	21.5	11.9	7.3	4.4	7.9
Mali	28.8	19.1	25.5	15.1	11.6
Mauritania	23.4	..	..	18.7	19.4
Egypt, Arab Rep.	23.2	32.4	31.5	25.1	19.1
Mozambique	..	..	..	14.0	11.6
Niger	14.2	..	..	38.5	15.1
Nigeria	8.2	..	..	19.9	10.2
Oman	..	15.2	18.5	22.5	12.1
Indonesia	15.4	12.7	5.1	10.0	8.5
Morocco	20.7	19.8	9.8	13.7	11.4
United Arab Emirate	..	11.1	..	11.1	..
Uganda	..	..	..	14.1	12.4

Country	1970	1980	1990	2000	2010
Uzbekistan	..	..	..	..	..
Qatar	..	15.0	17.4	11.7	8.2
Senegal	28.9	24.6	28.7	23.3	22.4
Saudi Arabia	..	14.1	14.8	18.5	15.7
Syrian Arab Republi	..	14.1	31.1	19.0	21.0
Somalia	33.7	32.5	..	..	..
Sierra Leone	..	..	..	32.7	..
Suriname	..	..	11.3	14.0	15.2
Pakistan	20.9	13.0	17.4	14.1	13.1
Tajikistan	..	..	..	10.2	..
Togo	23.1	16.5	22.4	18.4	15.7
Jordan	31.0	18.2	25.9	21.3	16.2
Tunisia	27.9	13.7	10.6	8.3	9.3
Turkmenistan	..	..	..	11.7	..
Yemen, Rep.	..	..	..	35.6	30.8

Source: WDI database

TABLE 1.11 AGRICULTURE AND FOOD EXPORT AVERAGES, 2008-2012, MILLION USD

Country	Dairy, Eggs	Meat, Meat Preparations	Live animals	Fish, Crustaceans, Mollusc	Vegetables	Fruit and Nuts, excluding oil nuts	Coffee, tea, cocoa, spices	Wheat and meslin, unmilled	Rice	Maize	Barley
Afghanistan	0.1	n/a	n/a	n/a	1.0	170.0	17.2	n/a	n/a	n/a	n/a
Albania	3.4	2.9	0.8	34.4	8.2	4.6	1.6	0.0	0.0	0.0	n/a
Algeria	1.9	1.2	0.1	7.9	13.8	21.9	3.9	n/a	0.0	n/a	1.6
Azerbaijan	0.3	7.7	0.1	3.2	59.1	154.0	35.2	0.5	0.0	n/a	0.0
Bahrain	141.0	3.9	1.3	18.4	1.8	3.2	3.0	0.1	0.4	n/a	0.0
Benin	0.2	80.1	0.0	0.5	0.0	33.8	0.1	n/a	46.6	3.2	n/a
Brunei Darussalam	0.2	0.1	0.0	2.4	0.1	0.1	0.1	n/a	0.0	0.0	n/a
Burkina Faso	0.2	0.0	15.4	0.9	5.0	24.2	0.3	n/a	0.4	4.2	n/a
Cameroon	3.1	0.1	1.1	2.0	1.6	82.4	649.0	0.0	0.7	0.2	n/a
Comoros	0.0	n/a	n/a	0.0	0.0	0.0	6.4	n/a	n/a	n/a	n/a
CotedIvoire	10.2	0.4	0.2	79.1	1.9	425.0	3,780.0	0.0	11.4	0.7	n/a
Djibouti	29.4	n/a	0.0	0.0	0.0	0.0	1.9	2.9	1.1	n/a	n/a
Egypt	453.0	8.9	13.8	16.4	798.0	911.0	133.0	1.9	224.0	4.2	4.4
Gabon	0.6	n/a	0.0	4.8	0.0	0.0	0.3	n/a	0.1	n/a	n/a
Gambia	2.1	0.1	0.0	5.2	0.2	3.3	1.7	n/a	0.2	n/a	n/a
Guinea	0.1	0.0	n/a	2.8	0.0	2.0	9.6	5.4	n/a	n/a	n/a
Guyana	0.3	0.1	0.9	60.1	1.0	3.6	0.6	0.0	145.0	0.0	0.0
Indonesia	117.0	28.5	55.1	2,810.0	93.3	337.0	3,110.0	6.3	1.0	16.7	n/a
Iran	445.0	32.6	24.6	165.0	649.0	2,160.0	417.0	75.5	0.0	0.0	0.0
Iraq	n/a	n/a	0.0	n/a	0.5	19.9	0.5	n/a	n/a	n/a	n/a
Jordan	75.1	116.0	66.9	6.8	432.0	107.0	24.9	0.7	2.0	3.4	0.4
Kazakhstan	6.4	4.6	0.9	82.3	31.3	25.2	23.8	1,040.0	17.8	2.0	86.9
Kuwait	29.9	5.2	7.4	2.7	0.6	5.6	3.2	n/a	8.8	0.0	0.1
Kyrgyzstan	30.2	3.5	5.8	0.3	67.6	41.0	4.0	0.3	1.0	0.2	0.0
Lebanon	9.1	17.0	1.4	3.7	36.8	68.0	47.8	4.8	1.0	0.4	0.8
Libya	0.4	0.0	n/a	0.8	n/a	n/a	n/a	n/a	0.0	n/a	n/a
Malaysia	355.0	83.1	177.0	779.0	143.0	93.2	1,530.0	2.0	0.5	1.3	0.1
Maldives	n/a	0.0	n/a	72.3	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Mali	2.7	0.0	92.3	0.1	1.1	15.5	0.3	0.6	2.4	0.1	n/a
Mauritania	n/a	0.0	n/a	331.0	n/a	0.0	n/a	n/a	n/a	n/a	n/a
Morocco	102.0	13.5	5.2	1,480.0	658.0	549.0	64.9	0.2	2.7	0.1	0.0

Country	Dairy, Eggs	Meat, Meat Preparations	Live animals	Fish, Crustaceans, Mollusc	Vegetables	Fruit and Nuts, excluding oil nuts	Coffee, tea, cocoa, spices	Wheat and meslin, unmilled	Rice	Maize	Barley
Mozambique	0.1	0.0	0.5	55.1	27.5	85.1	4.0	0.7	2.3	2.6	0.1
Niger	0.5	0.0	118.0	0.7	40.9	0.8	1.8	0.0	11.2	0.2	n/a
Nigeria	254.0	5.0	10.7	234.0	1.9	247.0	1,690.0	0.3	2.6	0.1	n/a
Oman	250.0	31.2	43.7	123.0	34.6	20.7	14.1	3.0	13.7	0.5	0.2
Pakistan	53.4	129.0	16.0	261.0	128.0	250.0	48.4	154.0	2,090.0	47.6	0.3
Qatar	1.1	4.5	27.4	2.9	2.0	1.7	1.0	0.0	1.4	0.0	0.3
Saudi Arabia	726.0	100.0	179.0	70.7	134.0	90.6	54.5	1.2	10.9	0.2	2.4
Senegal	15.8	0.8	0.3	253.0	24.2	12.6	5.3	0.5	35.5	1.2	n/a
State of Palestine	15.4	5.9	0.0	0.2	9.1	8.4	13.8	0.5	0.5	0.4	0.6
Sudan	0.0	38.6	372.0	0.2	21.1	4.1	0.2	n/a	0.0	14.5	n/a
Suriname	0.9	0.8	0.6	0.5	1.6	n/a	2.0	n/a	31.3	0.0	n/a
Syria	385.0	29.6	202.0	0.4	395.0	353.0	92.4	19.2	0.2	0.1	n/a
Togo	16.9	0.7	0.0	1.1	0.3	1.3	17.9	0.0	1.1	2.4	n/a
Tunisia	40.1	7.0	0.9	180.0	42.0	242.0	55.8	11.1	0.7	7.6	n/a
Turkey	387.0	304.0	11.8	391.0	978.0	3,360.0	567.0	60.9	45.6	38.8	28.9
Uganda	13.3	1.3	2.8	111.0	19.8	2.1	467.0	1.2	20.2	21.8	0.0
United Arab Emirat	240.0	106.0	22.5	72.7	159.0	425.0	391.0	16.6	488.0	21.3	12.5
Yemen	21.7	0.3	0.0	209.0	15.8	46.5	28.1	0.3	3.4	2.7	0.1
Total OIC	4,239.9	1,174.3	1,478.4	7,938.5	5,039.6	10,411.4	13,324.4	1,410.6	3,225.6	198.9	139.8

Source: UN COMTRADE Database (UN 2014).

TABLE 1.12 AGRICULTURE AND FOOD EXPORT AVERAGES BY GROUP, 2008-2012.

	Agriculture Based	Transition 1	Transition 2	Urbanizing	Urban
Dairy, Eggs	6%	2%	3%	9%	19%
Meat, Meat Preparations	3%	0%	2%	1%	6%
Live animals	13%	0%	1%	2%	5%
Fish, Crustaceans, Mollusc	14%	31%	15%	13%	3%
Vegetables	2%	4%	5%	14%	12%
Fruit and Nuts, excluding oil nuts	13%	1%	18%	22%	12%
Coffee, tea, cocoa, spices	37%	40%	32%	12%	8%
Wheat and meslin, unmilled	0%	1%	1%	6%	0%
Rice	1%	5%	9%	2%	8%
Maize	1%	2%	0%	0%	0%
Barley	0%	0%	0%	0%	0%
Sugar	3%	5%	3%	7%	16%
Feed	5%	2%	2%	4%	2%
Miscellaneous edible products	1%	7%	8%	9%	8%
Total (percentage)	100%	100%	100%	100%	100%
Total Value (Million USD)	4,551	1,192	25,300	20,769	6,255

Source: UN COMTRADE Database (UN 2014).

Note: Shown as share of a given commodity group in the group's total exports. Several OIC members (Brunei Darussalam, Comoros, Djibouti, Maldives, Palestine, Suriname) were not included in the calculations due to incomplete data.

TABLE 1.13 AGRICULTURE AND FOOD IMPORT AVERAGES, 2008-2012, MILLION USD

Country	Dairy, Eggs	Meat, Meat Preparations	Live animals	Fish, Crustaceans, Mollusc	Vegetables	Fruit and Nuts, excluding oil nuts	Coffee, tea, cocoa, spices	Wheat and meslin, unmilled	Rice	Maize	Barley
Afghanistan	29.6	0	1	0	11.8	2.8	128.0	n/a	n/a	n/a	n/a
Albania	28.6	76.2	35.4	28.8	23.5	57.0	39.9	83.9	15.7	18.2	0
Algeria	1,190.0	188.0	94.9	56.4	321.0	262.0	402.0	2,250	57.5	731	73.0
Azerbaijan	55.7	24.5	10.7	12.6	20.5	33.4	52.1	292.0	11.4	16	4.6
Bahrain	194.0	154.0	90.6	17.3	63.7	64.8	52.5	35.8	58.5	5	0.2
Benin	26.5	138.0	0.1	28.8	0.6	12.6	2.0	5	118.0	0.4	n/a
Brunei Darussalam	44.9	34.5	8.8	42.3	20.9	28.7	30.6	0	59.6	2.0	0
Burkina Faso	18.5	0.7	0.1	8.4	1.6	7.4	9.0	27	79.3	0.1	n/a
Cameroon	47.9	10.2	0.8	235.0	3.5	4.3	6.6	162.0	255.0	5.0	3
Comoros	4.4	11	0	1.6	0.6	8.2	0.5	0	21	0	n/a
CotedIvoire	77.5	70.9	2.0	342.0	35.0	9.9	12.9	157.0	556.0	6.0	0
Djibouti	19.5	5	0.0	6.6	3.4	18.0	13.2	0.1	4.9	0	n/a
Egypt	556.0	913.0	99.7	525.0	464.0	235.0	498.0	2,450.0	50.5	1,440.0	4.8
Gabon	44.4	111	1.0	18.5	4.3	3.7	9.0	20	56.5	0	0
Gambia	6.7	2.4	0.0	0.8	3.7	0.1	3.1	0	27.2	0	0
Guinea	4.0	3.5	0	0.9	5.7	0.2	3.0	2.0	75	3	n/a
Guyana	39.6	4.5	0.3	2.0	13.4	1.1	5.9	22.5	0.1	9.1	0.0
Indonesia	940.0	285.0	379.0	197.0	406.0	676.0	412.0	1,830.0	610.0	414.0	0
Iran	366.0	940.0	52.0	73.3	116.0	598.0	321.0	168.0	959.0	1,110.0	180.0
Iraq	0.0	0	0.0	n/a	0.0	0.0	n/a	0	0	0	n/a
Jordan	227.0	301.0	73.5	86.7	106.0	152.0	153.0	209.0	143.0	174.0	133.0
Kazakhstan	358.0	262.0	40.5	73.2	111.0	268.0	346.0	4.8	14.9	1.3	17.0
Kuwait	535.0	404.0	142.0	79.3	239.0	308.0	195.0	155	348.0	44.1	113.0
Kyrgyzstan	19.0	61.9	0.3	10.0	2.4	20.1	70.7	73.3	13.7	0.4	1.9
Lebanon	272.0	214.0	268.0	110.0	127.0	107.0	181.0	142.0	45.4	99.9	17.3
Libya	184.0	52.7	12	52.9	9	63	45	335	114.0	83	54
Malaysia	709.0	554.0	73.0	786.0	598.0	313.0	1,590.0	386.0	616.0	775.0	2.4
Maldives	35.5	29.2	0	12.8	27	25	17	0	15	0	0
Mali	35.7	0.4	0.9	10.5	7.3	5.0	33.8	50.9	62.2	1.1	n/a
Mauritania	66.7	8.2	0	0.6	13	2.7	12	101	55	0	0
Morocco	258.0	43.3	78.4	122.0	65.5	118.0	287.0	1,200.0	9.2	512.0	88.4

Country	Dairy, Eggs	Meat, Meat Preparations	Live animals	Fish, Crustaceans, Mollusc	Vegetables	Fruit and Nuts, excluding oil nuts	Coffee, tea, cocoa, spices	Wheat and meslin, unmilled	Rice	Maize	Barley
Mozambique	33.3	18.1	1.9	44.2	13.7	3.7	11.3	103.0	114.0	19.0	0.3
Niger	31.7	0.7	0.1	1.5	3.6	4.7	12.4	1.2	94.8	8.0	n/a
Nigeria	647.0	1.6	3.5	1,150.0	7.7	22.1	461.0	1,520.0	927.0	6.0	0
Oman	454.0	265.0	123.0	39.6	94.0	111.0	128.0	89.1	197.0	28.4	10.8
Pakistan	89.6	7.5	12.9	3.2	479.0	119.0	398.0	483.0	22.8	39.0	1.0
Qatar	249.0	321.0	199.0	58.5	145.0	106.0	108.0	47.9	147.0	6.9	32.1
Saudi Arabia	1,490.0	2,040.0	605.0	368.0	378.0	792.0	934.0	441.0	1,280.0	534.0	2,110.0
Senegal	132.0	15.9	1.2	8.4	42.1	24.1	28.6	151.0	418.0	35.0	0
State of Palestine	67.0	30.3	69.0	11.8	13.3	44.7	51.1	23.8	44.3	10.5	16.0
Sudan	65.5	5.4	3.5	5.2	65.3	20.4	83.6	0	27.1	2.7	n/a
Suriname	12.7	26.2	0.2	3.8	8.0	1	4.3	3	0.3	6.0	n/a
Syria	196.0	30.6	24.1	57.3	128.0	137.0	166.0	225.0	213.0	346.0	155
Togo	11.6	11.3	0.0	21.3	1.7	0.7	2.5	22.5	13.0	0.5	n/a
Tunisia	48.5	24.9	21.1	69.4	36.8	20.5	101.0	540.0	9.2	202.0	82
Turkey	126.0	174.0	458.0	144.0	318.0	357.0	573.0	1,160.0	167.0	205.0	34.4
Uganda	5.1	2.1	2.0	1.8	5.2	2.6	7.5	112.0	36.1	1.2	1.4
United Arab Emirate	1,000.0	1,240.0	158.0	344.0	837.0	1,180.0	1,050.0	271.0	1,330.0	73.2	66.6
Yemen	237.0	179.0	55.5	13.7	39.9	28.4	57.1	869.0	277.0	123.0	0.1
Total OIC	*11,289.7*	*9,297.4*	*3,203.3*	*5,287.0*	*5,441.0*	*6,380.3*	*9,109.7*	*16,224.1*	*9,768.3*	*7,096.9*	*3,203.7*

Source: UN COMTRADE Database (UN 2014).

TABLE 1.14 AGRICULTURE AND FOOD IMPORT AVERAGES BY GROUP, 2008-2012.

	Agriculture Based	Transition 1	Transition 2	Urbanizing	Urban
Dairy, Eggs	10%	9%	8%	9%	12%
Meat, Meat Preparations	2%	1%	5%	7%	14%
Live animals	0%	0%	4%	1%	5%
Fish, Crustaceans, Mollusc	13%	1%	4%	4%	3%
Vegetables	1%	3%	6%	4%	6%
Fruit and Nuts, excluding oil nuts	1%	2%	6%	5%	9%
Coffee, tea, cocoa, spices	8%	3%	7%	9%	8%
Wheat and meslin, unmilled	18%	17%	20%	18%	5%
Rice	15%	35%	9%	5%	11%
Maize	0%	3%	3%	12%	3%
Barley	0%	0%	0%	1%	8%
Sugar	14%	14%	9%	11%	5%
Feed	2%	1%	13%	8%	4%
Miscellaneous edible products	17%	11%	6%	6%	8%
Total (percentage)	100%	100%	100%	100%	100%
Total Value (Million USD)	10,041	1,527	24,490	42,810	32,900

Source: UN COMTRADE Database (UN 2014).

Note: Shown as share of a given commodity group in the group's total import. Several OIC members (Brunei Darussalam, Comoros, Djibouti, Maldives, Palestine, Suriname) were not included in the calculations due to incomplete data.

TABLE 1.15 ARABLE LAND (TOTAL, AND AS % OF TOTAL LAND AREA)

	1970		1980		1990		2000		2010	
Country	Arable land (ha)	as % of total land	Arable land (ha	as % of total land	Arable land (ha	as % of total land	Arable land (ha	as % of total land	Arable land (ha	as % of total land
Afghanistan	7,870,000	12.1	7,910,000	12.1	7,910,000	12.1	7,683,000	11.8	7,792,000	11.9
Albania	521,000	19.0	585,000	21.4	579,000	21.1	578,000	21.1	626,000	22.8
Algeria	6,248,000	2.6	6,875,000	2.9	7,081,000	3.0	7,662,000	3.2	7,502,000	3.1
Azerbaijan	..	..	..	..	..	..	1,825,600	22.1	1,884,100	22.8
Bahrain	1,000	1.4	2,000	2.9	2,000	2.9	2,000	2.8	1,360	1.8
Bangladesh	8,837,000	67.9	9,121,000	70.1	9,456,000	72.6	8,350,000	64.1	7,741,000	59.5
Benin	1,200,000	10.6	1,500,000	13.3	1,615,000	14.3	2,380,000	21.1	2,540,000	22.5
Brunei Darussalam	6,000	1.1	3,000	0.6	2,000	0.4	2,000	0.4	3,000	0.6
Burkina Faso	2,216,000	8.1	2,745,000	10.0	3,520,000	12.9	3,700,000	13.5	6,000,000	21.9
Djibouti	1,000	0.0	1,000	0.0	1,000	0.0	1,000	0.0	2,000	0.1
Chad	2,897,000	2.3	3,137,000	2.5	3,273,000	2.6	3,600,000	2.9	4,500,000	3.6
Cote d'Ivoire	1,700,000	5.3	1,955,000	6.1	2,430,000	7.6	2,800,000	8.8	2,900,000	9.1
Gabon	180,000	0.7	290,000	1.1	295,000	1.1	325,000	1.3	325,000	1.3
Gambia, The	130,000	12.8	159,000	15.7	187,000	18.5	280,000	27.7	450,000	44.5
Guinea	3,329,000	13.5	3,091,000	12.6	2,853,000	11.6	2,149,000	8.7	2,850,000	11.6
Guinea-Bissau	245,000	8.7	255,000	9.1	250,000	8.9	300,000	10.7	300,000	10.7
Guyana	360,000	1.8	480,000	2.4	480,000	2.4	450,000	2.3	420,000	2.1
Cameroon	5,400,000	11.4	5,910,000	12.5	5,940,000	12.6	5,960,000	12.6	6,200,000	13.1
Iraq	4,848,000	11.1	5,250,000	12.0	5,000,000	11.4	4,100,000	9.4	4,000,000	9.2
Iran, Islamic Rep.	15,150,000	9.3	12,981,000	8.0	15,190,000	9.3	14,924,000	9.2	17,373,000	10.7
Kazakhstan	..	..	..	..	..	..	21,535,000	8.0	23,585,000	8.7
Kyrgyz Republic	..	..	..	..	..	..	1,356,000	7.1	1,276,200	6.7
Comoros	75,000	40.3	75,000	40.3	78,000	41.9	80,000	43.0	82,000	44.1
Kuwait	1,000	0.1	1,000	0.1	4,000	0.2	10,000	0.6	11,000	0.6
Lebanon	235,000	23.0	210,000	20.5	183,000	17.9	129,000	12.6	114,000	11.1
Libya	1,725,000	1.0	1,753,000	1.0	1,805,000	1.0	1,815,000	1.0	1,750,000	1.0
Maldives	2,000	6.7	3,000	10.0	3,000	10.0	3,000	10.0	3,000	10.0
Malaysia	920,000	2.8	1,000,000	3.0	1,700,000	5.2	1,820,000	5.5	1,800,000	5.5
Mali	1,718,000	1.4	2,010,000	1.6	2,053,000	1.7	4,589,000	3.8	6,261,000	5.1
Mauritania	278,000	0.3	210,000	0.2	400,000	0.4	488,000	0.5	450,000	0.4
Egypt, Arab Rep.	2,725,000	2.7	2,286,000	2.3	2,284,000	2.3	2,801,000	2.8	2,873,000	2.9
Mozambique	2,785,000	3.5	2,870,000	3.6	3,450,000	4.4	3,900,000	5.0	5,200,000	6.6
Niger	11,197,000	8.8	10,212,000	8.1	11,036,000	8.7	13,980,000	11.0	14,940,000	11.8
Nigeria	27,420,000	30.1	27,850,000	30.6	29,539,000	32.4	30,000,000	32.9	36,000,000	39.5
Oman	22,000	0.1	23,000	0.1	35,000	0.1	31,000	0.1	32,200	0.1
Indonesia	18,000,000	9.9	18,000,000	9.9	20,253,000	11.2	20,500,000	11.3	23,600,000	13.0
Morocco	7,076,000	15.9	7,530,000	16.9	8,707,000	19.5	8,767,000	19.6	7,829,600	17.5

	1970		1980		1990		2000		2010	
Country	Arable land (ha	as % of total land	Arable land (ha	as % of total land	Arable land (ha	as % of total land	Arable land (ha	as % of total land	Arable land (ha	as % of total land
United Arab Emirates	7,000	0.1	16,000	0.2	35,000	0.4	60,000	0.7	50,600	0.6
Uganda	3,780,000	18.9	4,080,000	20.4	5,000,000	25.0	5,300,000	26.5	6,750,000	33.8
Uzbekistan	..	..	..	..	..	..	4,475,000	10.5	4,300,000	10.1
Qatar	1,000	0.1	4,000	0.3	10,000	0.9	13,000	1.1	14,000	1.2
Senegal	3,148,000	16.4	3,121,000	16.2	3,092,000	16.1	3,050,000	15.8	3,850,000	20.0
Saudi Arabia	1,360,000	0.6	1,890,000	0.9	3,390,000	1.6	3,592,000	1.7	3,110,000	1.4
Syrian Arab Republic	5,651,000	30.7	5,230,000	28.5	4,885,000	26.6	4,542,000	24.7	4,687,000	25.5
Somalia	936,000	1.5	984,000	1.6	1,022,000	1.6	1,043,000	1.7	1,100,000	1.8
Sierra Leone	400,000	5.6	450,000	6.3	486,000	6.8	490,000	6.8	1,100,000	15.4
Suriname	30,000	0.2	40,000	0.3	57,000	0.4	57,000	0.4	55,000	0.4
Pakistan	19,167,000	24.9	19,994,000	25.9	20,484,000	26.6	21,292,000	27.6	20,548,000	26.7
Tajikistan	..	..	..	..	..	..	784,000	5.6	839,000	6.0
Togo	1,800,000	33.1	1,950,000	35.9	2,100,000	38.6	2,500,000	46.0	2,490,000	45.8
Jordan	284,000	3.2	299,000	3.4	179,200	2.0	190,000	2.2	177,600	2.0
Tunisia	3,193,000	20.6	3,191,000	20.5	2,909,000	18.7	2,864,000	18.4	2,823,000	18.2
Turkmenistan	..	..	..	..	..	..	1,620,000	3.4	1,900,000	4.0
Yemen, Rep.	1,332,000	2.5	1,366,000	2.6	1,523,000	2.9	1,545,000	2.9	1,291,000	2.4

Source: WDI database

TABLE 1.16 EMPLOYMENT IN AGRICULTURE (% OF TOTAL EMPLOYMENT)

Country	1980	1990	2000	2010
Afghanistan	..	..	..	..
Albania	..	..	71.8	41.5
Algeria	..	..	..	11.7
Azerbaijan	..	30.9	41	38.2
Bahrain	..	..	..	1.1
Bangladesh	..	..	62.1	..
Benin	..	..	..	..
Brunei Darussalam	..	..	..	..
Burkina Faso	..	..	..	..
Djibouti	..	..	..	..
Chad	..	..	..	..
Cote d'Ivoire	..	..	..	..
Gabon	..	..	..	..
Gambia, The	..	..	..	..
Guinea	..	..	..	..
Guinea-Bissau	..	..	..	..
Guyana	..	..	..	..
Cameroon	..	..	..	53.3
Iraq	..	..	..	..
Iran, Islamic Rep.	..	..	..	..
Kazakhstan	..	..	..	28.3
Kyrgyz Republic	..	32.7	53.1	..
Comoros	..	..	..	..
Kuwait	..	..	..	..
Lebanon	..	..	..	..
Libya	18.9	..	..	..
Maldives	..	25.2	13.7	..
Malaysia	37.2	26	18.4	13.3
Mali	..	..	..	..
Mauritania	..	..	..	..
Egypt, Arab Rep.	42.4	39	29.6	28.2
Mozambique	..	..	..	..
Niger	..	..	..	..
Nigeria	..	..	..	..
Oman	..	..	6.4	5.2
Indonesia	56.4	55.9	45.3	38.34747
Morocco	..	3.9	5.1	40.2
United Arab Emirates	..	..	7.9	..
Uganda	..	..	..	..

Country	1980	1990	2000	2010
Uzbekistan	..	..	..	..
Qatar	..	..	..	..
Senegal	..	..	..	..
Saudi Arabia	..	..	6.1	..
Syrian Arab Republic	..	..	32.9	14.3
Somalia	..	..	..	..
Sierra Leone	..	..	..	..
Suriname	..	3.7	..	..
Pakistan	52.7	51.1	48.4	..
Tajikistan	..	..	..	..
Togo	..	..	..	..
Jordan	..	..	4.9	2
Tunisia	33.4	..	..	17.6
Turkmenistan	..	..	..	..
Yemen, Rep.	..	..	..	24.7

Source: WDI database

TABLE 1.17 FERTILIZER CONSUMPTION (KILOGRAMS PER HECTARE OF ARABLE LAND)

Country	2002	2003	2004	2005	2006	2007	2008	2009	2010
Afghanistan	3.4	3.3	4.5	4.2	6.3	3.6	3.0	4.5	4.3
Albania	97.2	98.9	100.6	111.6	85.1	87.2	75.9	89.4	83.3
Algeria	9.6	6.0	25.1	7.4	13.3	15.0	8.6	7.9	12.7
Azerbaijan	10.4	7.6	12.0	13.4	13.3	10.6	20.9	13.4	10.0
Bahrain	8,964.5	103.5	0.0	2,906.7	9,436.6	798.6	1,993.3	947.8	1,953.7
Bangladesh	188.6	160.3	170.7	197.7	193.2	184.4	200.1	161.0	184.4
Benin	16.4	0.8	0.1	0.5	0.0	0.2	0.3	6.5	0.5
Brunei Darussalam	336.0	102.0	151.5	308.5	66.0	377.0	112.7	137.0	575.3
Burkina Faso	0.4	10.4	12.5	15.2	13.4	10.1	9.4	9.5	9.4
Djibouti	..	..	..	..	..	..	..	..	..
Chad	..	..	..	..	..	..	..	..	..
Cote d'Ivoire	31.0	30.4	27.2	17.8	22.8	24.0	18.2	15.3	32.2
Gabon	5.6	3.6	5.1	8.3	8.5	9.1	10.5	12.0	3.2
Gambia, The	0.0	9.1	8.0	9.6	10.8	9.0	4.3	6.3	7.3
Guinea	1.0	0.8	1.0	0.9	0.9	1.2	1.3	0.6	1.1
Guinea-Bissau	..	..	..	..	..	..	..	..	..
Guyana	33.1	23.1	44.8	22.1	32.6	32.7	56.8	20.3	39.3
Cameroon	9.8	8.2	11.1	8.0	9.0	8.6	6.6	6.7	5.0
Iraq	0.0	0.0	24.4	41.6	46.3	37.6	56.9	72.5	34.3
Iran, Islamic Rep.	78.7	80.3	103.8	95.0	114.0	90.0	91.1	69.7	52.0
Kazakhstan	1.0	1.5	1.9	1.8	1.8	2.6	1.4	2.4	1.6
Kyrgyz Republic	7.1	24.7	21.7	24.6	22.2	22.5	19.0	21.3	22.7
Comoros	..	..	..	..	..	..	..	..	..
Kuwait	1,763.3	0.0	0.0	4,349.1	2,090.9	0.0	1,261.9	53.6	803.6
Lebanon	358.0	132.4	142.3	313.8	297.9	320.1	219.6	234.3	296.7
Libya	66.3	33.1	51.7	67.1	42.3	61.0	27.3	40.3	45.3
Maldives	6.0	8.0	10.3	29.7	117.7	87.3	22.3	7.3	3.7
Malaysia	603.0	660.7	830.2	775.3	855.7	954.5	1,037.0	770.2	1,096.5
Mali	0.0	0.0	52.0	15.7	17.5	31.1	22.5	6.1	19.6
Mauritania	..	..	..	..	..	..	..	..	..
Egypt, Arab Rep.	432.5	627.8	557.6	672.9	492.1	521.8	696.6	502.8	605.1
Mozambique	6.0	0.7	2.3	1.6	4.7	2.9	12.8	4.3	8.9
Niger	0.6	0.3	0.2	0.4	0.5	0.4	0.2	0.4	0.5
Nigeria	4.8	6.7	4.8	7.4	10.0	4.1	5.7	5.0	5.7
Oman	382.9	391.9	472.4	1,365.8	1,063.6	363.8	724.1	632.4	121.3
Indonesia	124.0	131.1	131.2	150.5	158.0	181.5	184.5	181.6	181.5
Morocco	65.6	55.3	49.0	63.8	60.2	58.8	53.8	41.9	39.1
United Arab Emirat	672.3	939.4	495.6	218.5	911.5	1,104.9	423.6	1,324.8	674.9
Uganda	1.3	1.6	1.5	1.0	1.3	1.2	2.9	2.1	1.7

Country	2002	2003	2004	2005	2006	2007	2008	2009	2010
Uzbekistan	0.0	0.0	0.0	0.0	162.5	166.7	173.0	193.3	205.9
Qatar	44.4	0.0	4,254.6	633.5	0.0	5,027.1	257.1	2,735.7	6,105.7
Senegal	11.6	10.8	12.5	9.7	2.2	2.0	2.3	4.9	7.6
Saudi Arabia	56.5	119.2	105.0	93.9	98.8	118.8	77.6	43.8	94.1
Syrian Arab Republ	68.4	75.8	73.2	84.9	84.5	80.6	88.0	65.4	33.0
Somalia	..	..	..	..	..	..	..	..	..
Sierra Leone	..	..	..	..	..	..	..	..	..
Suriname	92.2	109.1	141.0	106.4	183.3	149.4	548.7	158.3	211.9
Pakistan	140.8	145.9	157.7	175.2	177.5	169.8	171.9	242.2	217.1
Tajikistan	0.0	0.0	33.9	37.8	73.9	74.1	70.4	64.9	54.2
Togo	5.2	7.5	3.4	9.7	5.5	6.3	0.2	0.9	0.4
Jordan	1,590.5	916.1	476.5	784.0	693.5	1,007.8	337.4	357.8	128.6
Tunisia	25.2	36.3	36.1	64.1	34.5	27.1	34.4	43.5	40.4
Turkmenistan	..	..	..	..	..	..	..	..	..
Yemen, Rep.	8.2	4.5	13.7	3.8	8.4	21.4	14.6	12.0	19.5

Source: WDI database

TABLE 1.18 POVERTY HEADCOUNT RATIO AT NATIONAL AND RURAL POVERTY LINES (AS % OF TOTAL AND RURAL POPULATION)

Country	2000		2001		2002		2003		2004		2005		2006		2007		2008		2009		2010		2011		2012	
	Natio-nal	Rural	Natio-nal	Rural	Natio-nal	Rural	Natio-nal	Rural	Natio-nal	Rural	Natio-nal	Rural	Natio-nal	Rural	Natio-nal	Rural	Natio-nal	Rural	Natio-nal	Rural	Natio-nal	Rural	Natio-nal	Rural	Natio-nal	Rural
Afghanistan	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	36	37.5	..	..	..	..	..	..	..	..
Albania	..	..	..	..	25.4	29.6	..	..	..	..	18.5	24.2	..	..	..	..	12.4	14.6	..	..	..	..	..	..	14.3	15.3
Algeria	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Azerbaijan	..	..	49.6	42.5	..	..	..	..	..	..	..	..	..	..	15.8	..	13.2	..	10.9	..	9.1	..	7.6	..	6	..
Bahrain	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Bangladesh	48.9	52.3	..	..	..	..	..	..	..	..	40	43.8	..	..	..	..	..	..	..	..	31.51	35.16	..	..	..	..
Benin	..	..	..	..	..	..	..	..	..	..	..	..	37.2	38.8	33.3	36.1	..	..	..	..	35.2	38.4	36.2	39.7	..	..
Brunei Darussalam	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Burkina Faso	..	..	..	..	..	..	51.1	65.8	..	..	..	..	..	..	..	..	..	..	46.7	52.8	..	..	..	..	..	..
Djibouti	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Chad	..	..	..	..	..	..	54.8	58.4	..	..	..	..	..	..	..	..	..	..	..	..	..	..	46.7	52.5	..	..
Cote d'Ivoire	..	..	..	..	40.2	45.8	..	..	..	..	..	..	..	..	..	..	42.7	54.2	..	..	..	..	..	..	..	..
Gabon	..	..	..	..	..	..	..	..	..	..	32.7	44.6	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Gambia, The	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	48.4	73.9	..	..	..	..
Guinea	..	..	..	..	49.1	59.9	..	..	..	..	..	..	..	..	53	63	..	..	..	..	..	..	..	..	55.2	64.7
Guinea-Bissau	..	..	..	..	64.7	69.7	..	..	..	..	..	..	..	..	..	..	..	..	..	..	69.3	75.6	..	..	..	..
Guyana	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Cameroon	..	..	40.2	52.1	..	..	..	..	..	..	..	..	..	..	39.9	55	..	..	..	..	..	..	..	..	..	..
Iraq	..	..	..	..	..	..	..	..	..	..	..	..	..	..	23.6	38.9	..	..	..	..	..	..	..	..	19.8	30.6
Iran, Islamic Rep.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Kazakhstan	..	..	46.7	59.4	44.5	58.4	37.5	53.2	33.9	47.1	31.6	45.6	18.2	24.4	12.7	18.1	12.1	15.9	8.2	12.1	6.5	10.1	5.5	8.8	3.8	6.1
Kyrgyz Republic	..	..	..	..	..	..	..	..	..	..	..	..	39.9	47.7	35	41.7	31.7	36.8	31.7	37.1	33.7	39.5	36.8	40.4	38	39.6
Comoros	..	..	..	..	..	..	..	..	44.8	48.7	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Kuwait	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Lebanon	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Libya	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Maldives	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Malaysia	..	..	..	..	6	13.5	..	..	5.7	11.9	..	..	..	..	3.6	7.1	..	..	3.8	8.4	..	..	..	..	1.7	3.4
Mali	..	..	55.6	64.8	..	..	..	..	..	..	..	..	47.5	57	..	..	..	..	..	..	43.6	50.6	..	..	..	..
Mauritania	51	66.2	..	..	..	..	..	..	46.7	59	..	..	..	..	..	..	42	59.4	..	..	..	..	..	..	..	..
Egypt, Arab Rep.	16.7	22.1	..	..	..	..	..	..	..	..	19.6	26.8	..	..	..	..	..	..	21.6	28.9	..	..	25.2	32.3	..	..
Mozambique	..	..	..	..	..	..	54.1	55.3	..	..	..	..	..	..	..	..	..	..	54.7	56.9	..	..	..	..	..	..

Country	2000		2001		2002		2003		2004		2005		2006		2007		2008		2009		2010		2011		2012	
	National	Rural	National	Rural	National	Rural	National	Rural	National	Rural	National	Rural	National	Rural	National	Rural	National	Rural	National	Rural	National	Rural	National	Rural	National	Rural
Niger	..	..	..	..	..	..	..	..	..	..	..	..	..	..	59.5	63.9	..	..	..	..	..	..	..	..	..	..
Nigeria	..	..	..	..	..	..	..	..	48.4	56.6	..	..	..	..	..	..	..	..	..	..	46	52.8	..	..	..	..
Oman	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Indonesia	..	..	..	..	18.2	21.1	17.4	20.2	16.7	20.1	16	20	17.8	21.8	16.6	20.4	15.4	18.9	14.2	17.4	13.3	16.6	12.5	15.7	12	15.1
Morocco	..	..	15.3	25.1	..	..	..	..	..	..	..	..	..	..	9	14.5	..	..	..	..	..	..	..	..	..	..
United Arab Emirat	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Uganda	33.8	37.4	..	..	38.8	42.7	..	..	..	..	31.1	34.2	..	..	..	..	..	..	24.5	27.2	..	..	..	..	..	..
Uzbekistan	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	17.7	..	16	..	..	..
Qatar	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Senegal	..	..	55.2	65.1	..	..	..	..	..	..	48.3	58.8	..	..	..	..	..	..	..	..	..	..	46.7	57.1	..	..
Saudi Arabia	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Syrian Arab Republ	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Somalia	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Sierra Leone	..	..	..	..	..	..	66.4	78.7	..	..	..	..	..	..	..	..	..	..	..	..	..	..	52.9	66.1	..	..
Suriname	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Pakistan	..	..	..	..	34.5	39.3	..	..	..	..	23.9	28.1	22.3	27	..	..	..	..	..	..	..	..	..	..	..	..
Tajikistan	..	..	..	..	..	..	72.4	73.8	..	..	..	..	..	..	53.1	54.4	..	..	47.2	49.2	..	..	..	..	..	..
Togo	..	..	..	..	..	..	..	..	..	..	..	..	61.7	75.1	..	..	..	..	..	..	..	..	58.7	73.4	..	..
Jordan	..	..	..	..	..	..	..	..	..	..	..	..	13	19	..	..	13.3	..	..	..	..	..	..	..	..	..
Tunisia	32.4	..	..	..	..	..	..	..	..	..	23.3	..	..	..	..	..	..	..	..	..	15.5	..	..	..	..	..
Turkmenistan	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Yemen, Rep.	..	..	..	..	..	..	..	..	..	..	34.8	40.1	..	..	..	..	..	..	..	..	..	..	..	..	..	..

Source: WDI database

TABLE 1.19 GDP PER CAPITA (CONSTANT 2005 US$)

Country	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Afghanistan	..	..	..	..	..	..	..	..	..	..	..	..	232.0	241.6	235.0	252.4	258.4	285.9	288.8	340.9	360.7
Albania	1,630.6	1,143.8	1,065.5	1,177.8	1,288.0	1,470.8	1,612.8	1,452.5	1,639.8	1,809.6	1,949.3	2,097.7	2,173.4	2,314.5	2,468.7	2,620.8	2,766.2	2,941.7	3,177.9	3,288.4	3,404.7
Algeria	2,544.5	2,452.8	2,438.8	2,334.8	2,265.9	2,306.9	2,358.8	2,345.4	2,427.1	2,468.2	2,487.3	2,567.2	2,675.7	2,831.0	2,912.3	3,038.7	3,041.5	3,092.0	3,098.4	3,094.1	3,146.7
Azerbaijan	1,668.9	1,631.7	1,243.9	942.1	746.4	650.8	652.6	683.8	745.1	793.3	874.1	953.2	1,046.4	1,154.8	1,261.5	1,578.4	2,099.7	2,596.1	2,816.0	3,017.7	3,126.7
Bahrain	14,596.8	15,799.5	16,433.9	18,100.2	17,612.4	17,831.8	18,053.4	18,060.3	18,308.2	18,399.0	18,581.9	18,213.2	18,000.9	18,108.4	18,228.7	18,156.4	17,878.8	17,835.0	17,526.5	16,833.9	16,722.2
Bangladesh	269.6	272.2	279.5	286.0	291.5	299.4	306.8	316.7	326.7	336.0	349.5	361.5	371.2	384.6	402.8	421.1	443.7	467.1	490.9	513.8	539.1
Benin	457.9	460.6	457.0	465.9	458.6	470.1	475.3	488.0	492.9	504.3	513.0	527.9	533.4	536.0	534.7	532.6	535.5	543.3	553.7	552.0	550.0
Brunei Darussalam	26,831.1	26,900.1	27,392.2	26,717.5	26,817.7	27,293.8	27,382.5	26,336.1	25,585.5	25,774.3	25,925.5	26,062.5	26,501.7	26,712.8	26,315.7	25,913.6	26,556.3	26,127.2	25,186.3	24,341.3	24,589.3
Burkina Faso	269.3	286.0	279.0	281.0	277.0	284.9	307.7	318.2	332.0	346.6	343.1	355.4	363.0	380.1	385.7	407.0	422.0	424.5	436.1	436.1	457.2
Djibouti	1,242.5	1,145.3	1,114.6	1,020.5	994.0	943.2	888.4	866.4	852.4	856.6	846.8	851.4	861.1	876.1	896.9	912.5	943.0	977.3	..	..	..
Chad	409.2	430.3	450.3	367.8	392.3	384.3	380.0	388.2	401.1	384.5	367.5	395.1	412.4	455.3	586.1	663.7	645.9	646.0	645.4	652.5	718.8
Cote d'Ivoire	1,075.8	1,040.7	1,004.4	970.7	948.5	986.2	1,032.3	1,061.6	1,083.6	1,075.3	1,014.4	996.4	967.1	938.8	942.6	940.8	932.8	933.6	939.1	956.5	960.0
Gabon	7,124.1	7,358.7	6,943.7	7,029.5	7,102.1	7,264.2	7,335.9	7,561.0	7,628.7	6,776.5	6,488.3	6,469.4	6,301.5	6,307.7	6,244.1	6,282.0	6,205.7	6,394.3	6,303.8	5,974.7	6,223.1
Gambia, The	424.6	422.8	423.6	424.0	413.0	405.2	402.8	410.9	413.5	427.5	437.9	449.4	421.5	436.5	452.7	434.5	425.8	427.7	438.3	452.1	466.7
Guinea	285.8	278.0	270.8	268.4	265.0	265.8	268.8	275.9	280.5	286.4	288.6	294.2	304.2	302.7	304.0	306.7	307.2	304.9	311.6	302.6	300.4
Guinea-Bissau	497.3	510.9	504.9	503.9	508.3	518.9	566.2	589.8	414.8	409.9	415.5	435.8	434.8	404.3	392.6	403.0	386.5	401.1	433.6	428.8	426.4
Guyana	681.4	724.0	780.9	843.9	913.5	956.0	1,027.6	1,086.8	1,063.2	1,089.6	1,069.6	1,089.0	1,096.1	1,080.8	1,111.5	1,084.2	1,133.0	1,084.7	1,098.5	1,127.2	1,168.9
Cameroon	999.7	933.8	879.0	826.8	783.6	787.2	804.2	822.7	841.4	855.4	868.1	883.9	895.6	907.9	917.4	914.6	920.0	922.0	931.2	924.6	931.4
Iraq	..	..	..	..	..	..	..	..	..	..	2,046.7	2,032.7	1,838.4	1,195.7	1,793.9	1,824.7	1,960.8	1,941.1	2,020.9	2,086.3	2,172.7
Iran, Islamic Rep.	1,801.3	1,988.9	2,043.8	1,988.6	1,959.0	1,984.2	2,091.4	2,124.1	2,142.2	2,145.1	2,219.4	2,268.3	2,407.4	2,548.0	2,646.7	2,737.1	2,864.8	3,053.1	3,034.8	3,116.6	3,259.4
Kazakhstan	3,073.3	2,718.2	2,575.9	2,354.5	2,087.9	1,950.6	1,990.3	2,056.3	2,052.4	2,128.0	2,343.5	2,664.4	2,925.4	3,186.8	3,468.5	3,771.3	4,130.9	4,447.4	4,538.5	4,473.5	4,732.7
Kyrgyz Republic	698.5	633.2	539.0	455.6	364.2	341.0	359.8	389.8	392.0	400.3	417.0	435.1	431.0	456.5	482.7	476.5	486.0	522.5	561.1	570.3	560.9
Comoros	732.7	676.5	716.8	720.8	666.5	673.9	648.9	658.4	650.3	646.2	638.9	643.5	653.3	652.5	634.3	644.3	635.6	622.3	612.4	607.7	604.8
Kuwait	..	..	..	..	..	31,237.8	31,444.3	31,222.3	30,745.6	28,598.1	28,561.2	27,689.1	27,578.1	31,313.3	33,418.2	35,185.9	35,936.4	36,040.0	34,920.5	30,765.8	28,615.9
Lebanon	3,518.0	4,774.5	4,866.7	5,065.4	5,335.1	5,573.7	5,788.2	5,616.1	5,778.1	5,674.1	5,610.6	5,620.1	5,548.6	5,457.3	5,616.7	5,483.2	5,390.4	5,710.8	6,171.3	6,600.0	6,908.8
Libya	..	..	..	..	..	..	..	..	..	6,803.0	6,941.2	6,538.6	6,354.8	7,072.1	7,270.1	7,864.9	8,194.2	8,542.2	8,723.9	8,776.4	..
Maldives	..	..	..	..	..	..	..	..	..	..	..	2,871.3	2,993.4	3,359.5	3,715.3	3,335.2	3,919.3	4,256.9	4,690.9	4,438.1	4,663.4
Malaysia	3,147.1	3,355.6	3,559.5	3,813.2	4,060.4	4,347.8	4,662.5	4,878.6	4,408.5	4,568.6	4,861.9	4,783.9	4,941.0	5,126.9	5,372.2	5,553.9	5,756.4	6,007.9	6,185.5	5,984.9	6,318.9
Mali	329.7	328.1	347.3	331.4	325.8	337.2	339.3	353.0	364.7	378.9	380.2	414.1	418.6	436.2	432.2	444.3	467.4	472.1	480.1	485.9	498.5
Mauritania	646.9	640.4	634.2	652.6	614.6	655.6	673.7	627.7	636.9	665.8	643.2	636.6	621.6	639.2	656.1	694.3	802.0	792.3	798.0	767.3	785.5
Egypt, Arab Rep.	879.2	872.4	895.7	907.1	928.7	956.9	989.2	1,027.5	1,052.4	1,099.3	1,140.1	1,161.7	1,170.1	1,187.8	1,216.1	1,249.5	1,312.8	1,382.4	1,456.6	1,499.3	1,550.2
Mozambique	186.9	191.4	175.9	184.1	189.5	188.2	196.2	210.5	227.3	239.6	235.9	256.8	271.7	280.0	296.2	313.1	324.0	338.4	352.2	364.9	380.8

Country	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Niger	302.9	300.7	272.1	266.9	268.2	265.7	265.2	262.8	279.8	268.2	255.0	263.4	261.6	265.6	256.4	258.3	263.4	261.7	276.3	264.2	275.7
Nigeria	590.1	571.7	559.8	557.4	548.6	533.4	546.2	547.7	548.7	537.6	552.2	562.2	569.0	612.1	797.9	804.2	847.5	881.6	912.0	949.0	995.7
Oman	9,144.9	9,314.8	9,684.6	9,876.3	9,941.3	10,218.4	10,426.1	11,046.4	11,372.7	11,352.4	11,855.1	12,477.5	12,413.3	12,029.9	12,060.9	12,252.6	12,761.7	13,550.8	15,145.1	14,911.0	14,962.0
Indonesia	840.2	899.4	948.0	1,000.0	1,058.1	1,129.1	1,196.9	1,234.7	1,057.1	1,050.2	1,086.1	1,109.5	1,142.9	1,180.5	1,222.2	1,273.5	1,324.5	1,388.6	1,451.6	1,498.0	1,570.2
Morocco	1,485.0	1,558.7	1,469.8	1,430.6	1,553.5	1,428.8	1,579.3	1,521.9	1,615.8	1,603.2	1,609.0	1,710.9	1,748.9	1,840.6	1,910.2	1,948.2	2,079.6	2,116.0	2,212.6	2,293.3	2,348.6
United Arab Emirate	48,855.5	46,654.2	45,700.4	43,917.0	44,610.7	45,278.8	45,490.3	46,609.5	44,292.3	43,370.3	45,969.0	45,038.3	44,819.8	46,661.4	47,081.2	43,533.9	40,689.0	35,309.6	31,070.4	26,053.4	24,219.3
Uganda	197.6	201.5	201.4	210.9	217.1	234.5	247.8	252.4	256.7	268.8	268.5	273.3	287.3	295.7	305.3	313.8	336.1	352.3	370.3	384.1	393.1
Uzbekistan	547.1	532.9	462.3	441.5	410.4	399.4	398.5	411.4	422.3	435.7	446.0	458.9	471.5	485.6	517.0	546.8	579.6	625.7	671.1	713.3	752.4
Qatar	..	..	..	..	..	..	..	..	..	..	51,089.6	51,226.6	53,317.7	52,630.1	57,506.2	54,228.8	58,065.5	57,519.8	57,388.7	55,831.1	58,257.0
Senegal	681.1	677.3	665.0	653.7	635.0	651.0	647.1	651.0	673.0	698.5	703.1	716.6	702.5	729.5	751.6	772.5	770.2	786.4	793.1	789.9	800.4
Saudi Arabia	12,205.0	12,891.5	13,079.0	12,718.1	12,493.9	12,269.3	12,495.4	12,676.4	12,885.6	12,569.0	12,837.7	12,446.4	11,929.2	12,337.3	12,846.0	13,303.3	13,667.7	14,182.8	15,115.2	15,144.6	15,994.8
Syrian Arab Republi	1,109.5	1,162.9	1,282.6	1,311.7	1,373.3	1,412.5	1,433.9	1,419.1	1,468.1	1,380.1	1,385.4	1,428.7	1,486.9	1,469.5	1,537.3	1,588.5	1,611.4	1,637.4	..	..	..
Somalia	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Sierra Leone	366.0	373.7	304.2	311.5	308.6	285.6	291.2	273.5	276.0	265.9	276.1	247.1	298.3	311.1	316.6	317.9	325.7	343.1	353.8	358.2	370.4
Suriname	3,120.6	3,159.8	3,109.7	2,845.8	2,899.7	2,892.4	2,889.8	3,014.3	3,020.0	2,952.8	2,909.9	2,999.7	3,084.5	3,224.4	3,476.3	3,590.5	3,686.7	3,835.3	3,955.9	4,037.6	4,169.6
Pakistan	524.9	536.3	562.6	558.0	564.2	577.1	589.3	579.6	579.0	585.5	596.7	596.0	603.5	621.5	655.5	693.2	722.6	743.5	742.2	749.4	748.0
Tajikistan	718.5	652.7	454.6	373.7	289.7	250.2	205.6	206.5	214.7	219.6	234.3	254.0	276.4	300.9	325.2	339.8	355.8	375.8	396.7	401.1	417.1
Togo	425.6	411.7	385.7	319.7	358.8	377.7	401.0	447.2	425.9	425.4	411.4	394.3	380.7	389.3	387.3	381.8	387.1	385.8	384.4	387.7	392.9
Jordan	1,766.5	1,608.5	1,812.7	1,812.7	1,830.4	1,881.4	1,862.9	1,866.4	1,864.6	1,893.5	1,926.1	1,978.1	2,042.4	2,075.6	2,199.6	2,325.4	2,457.5	2,599.7	2,727.5	2,814.3	2,816.9
Tunisia	2,002.2	2,039.5	2,154.2	2,158.8	2,187.5	2,203.4	2,326.6	2,419.7	2,503.3	2,620.5	2,713.0	2,813.8	2,832.9	2,972.6	3,124.7	3,219.0	3,358.1	3,537.2	3,663.3	3,735.0	3,807.1
Turkmenistan	2,192.0	2,033.2	1,680.1	1,658.3	1,336.7	1,213.1	1,270.2	1,107.7	1,170.3	1,346.8	1,404.1	1,448.9	1,437.3	1,469.0	1,526.4	1,707.0	1,873.0	2,055.8	2,329.6	2,441.2	2,632.4
Yemen, Rep.	666.5	674.4	693.0	684.8	696.8	705.8	712.0	725.5	747.0	753.7	778.1	784.9	792.9	799.8	809.0	831.9	836.6	843.3	853.0	865.0	909.8

Source: WDI database

TABLE 1.20 GDP PER CAPITA GROWTH (ANNUAL %)

Country	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Afghanistan	..	..	..	4.2	-2.7	7.4	2.4	10.6	1.0	18.1	5.8
Albania	7.7	7.6	3.6	6.5	6.7	6.2	5.5	6.3	8.0	3.5	3.5
Algeria	0.8	3.2	4.2	5.8	2.9	4.3	0.1	1.7	0.2	-0.1	1.7
Azerbaijan	10.2	9.1	9.8	10.4	9.2	25.1	33.0	23.6	8.5	7.2	3.6
Bahrain	1.0	0.0	0.4	1.7	-0.6	0.6	-1.3	-0.2	-1.7	-3.4	-0.7
Bangladesh	4.0	3.4	2.7	3.6	4.7	4.5	5.4	5.3	5.1	4.7	4.9
Benin	1.7	2.9	1.0	0.5	-0.2	-0.4	0.5	1.5	1.9	-0.3	-0.3
Brunei Darussalam	0.6	0.5	1.7	0.8	-1.5	-1.5	2.5	-1.6	-3.6	-3.4	1.0
Burkina Faso	-1.0	3.6	2.1	4.7	1.5	5.5	3.7	0.6	2.7	0.0	4.8
Djibouti	-1.1	0.5	1.1	1.7	2.4	1.7	3.3	3.6	..	..	..
Chad	-4.4	7.5	4.4	10.4	28.7	13.2	-2.7	0.0	-0.1	1.1	10.2
Cote d'Ivoire	-5.7	-1.8	-2.9	-2.9	0.4	-0.2	-0.8	0.1	0.6	1.8	0.4
Gabon	-4.3	-0.3	-2.6	0.1	-1.0	0.6	-1.2	3.0	-1.4	-5.2	4.2
Gambia, The	2.4	2.6	-6.2	3.6	3.7	-4.0	-2.0	0.4	2.5	3.2	3.2
Guinea	0.8	1.9	3.4	-0.5	0.4	0.9	0.2	-0.8	2.2	-2.9	-0.7
Guinea-Bissau	1.4	4.9	-0.2	-7.0	-2.9	2.7	-4.1	3.8	8.1	-1.1	-0.6
Guyana	-1.8	1.8	0.7	-1.4	2.8	-2.5	4.5	-4.3	1.3	2.6	3.7
Cameroon	1.5	1.8	1.3	1.4	1.1	-0.3	0.6	0.2	1.0	-0.7	0.7
Iraq	..	-0.7	-9.6	-35.0	50.0	1.7	7.5	-1.0	4.1	3.2	4.1
Iran, Islamic Rep.	3.5	2.2	6.1	5.8	3.9	3.4	4.7	6.6	-0.6	2.7	4.6
Kazakhstan	10.1	13.7	9.8	8.9	8.8	8.7	9.5	7.7	2.0	-1.4	5.8
Kyrgyz Republic	4.2	4.3	-0.9	5.9	5.7	-1.3	2.0	7.5	7.4	1.7	-1.7
Comoros	-1.1	0.7	1.5	-0.1	-2.8	1.6	-1.4	-2.1	-1.6	-0.8	-0.5
Kuwait	-0.1	-3.1	-0.4	13.5	6.7	5.3	2.1	0.3	-3.1	-11.9	-7.0
Lebanon	-1.1	0.2	-1.3	-1.6	2.9	-2.4	-1.7	5.9	8.1	6.9	4.7
Libya	2.0	-5.8	-2.8	11.3	2.8	8.2	4.2	4.2	2.1	0.6	..
Maldives	..	..	4.3	12.2	10.6	-10.2	17.5	8.6	10.2	-5.4	5.1
Malaysia	6.4	-1.6	3.3	3.8	4.8	3.4	3.6	4.4	3.0	-3.2	5.6
Mali	0.4	8.9	1.1	4.2	-0.9	2.8	5.2	1.0	1.7	1.2	2.6
Mauritania	-3.4	-1.0	-2.3	2.8	2.6	5.8	15.5	-1.2	0.7	-3.8	2.4
Egypt, Arab Rep.	3.7	1.9	0.7	1.5	2.4	2.7	5.1	5.3	5.4	2.9	3.4
Mozambique	-1.6	8.9	5.8	3.1	5.8	5.7	3.5	4.5	4.1	3.6	4.4
Niger	-4.9	3.3	-0.7	1.5	-3.5	0.7	2.0	-0.6	5.6	-4.4	4.3
Nigeria	2.7	1.8	1.2	7.6	30.3	0.8	5.4	4.0	3.4	4.1	4.9
Oman	4.4	5.2	-0.5	-3.1	0.3	1.6	4.2	6.2	11.8	-1.5	0.3
Indonesia	3.4	2.2	3.0	3.3	3.5	4.2	4.0	4.8	4.5	3.2	4.8
Morocco	0.4	6.3	2.2	5.2	3.8	2.0	6.7	1.7	4.6	3.6	2.4
United Arab Emirate	6.0	-2.0	-0.5	4.1	0.9	-7.5	-6.5	-13.2	-12.0	-16.1	-7.0
Uganda	-0.1	1.8	5.1	2.9	3.2	2.8	7.1	4.8	5.1	3.7	2.4

Country	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Uzbekistan	2.4	2.9	2.7	3.0	6.5	5.8	6.0	8.0	7.3	6.3	5.5
Qatar	..	0.3	4.1	-1.3	10.8	-5.6	0.7	-0.9	-0.2	-2.7	4.3
Senegal	0.7	1.9	-2.0	3.8	3.0	2.8	-0.3	2.1	0.9	-0.4	1.3
Saudi Arabia	2.1	-3.0	-4.2	3.4	4.1	3.6	2.7	3.8	6.6	0.2	5.6
Syrian Arab Republi	0.4	3.1	4.1	-1.2	4.6	3.3	1.4	1.6	0.5	2.5	0.8
Somalia	..	..	..	..	..	..	..	..	..	..	..
Sierra Leone	3.8	-10.5	20.7	4.3	1.8	0.4	2.4	5.3	3.1	1.3	3.4
Suriname	-1.5	3.1	2.8	4.5	7.8	3.3	2.7	4.0	3.1	2.1	3.3
Pakistan	1.9	-0.1	1.3	3.0	5.5	5.7	4.2	2.9	-0.2	1.0	-0.2
Tajikistan	6.7	8.4	8.8	8.9	8.1	4.5	4.7	5.6	5.6	1.1	4.0
Togo	-3.3	-4.1	-3.5	2.3	-0.5	-1.4	1.4	-0.3	-0.4	0.9	1.3
Jordan	1.7	2.7	3.3	1.6	6.0	5.7	5.7	5.8	4.9	3.2	0.1
Tunisia	3.5	3.7	0.7	4.9	5.1	3.0	4.3	5.3	3.6	2.0	1.9
Turkmenistan	4.3	3.2	-0.8	2.2	3.9	11.8	9.7	9.8	13.3	4.8	7.8
Yemen, Rep.	3.2	0.9	1.0	0.9	1.2	2.8	0.6	0.8	1.2	1.4	5.2

Source: WDI database

TABLE 1.21 MOBILE CELLULAR SUBSCRIPTION (TOTAL AND PER 100 PEOPLE)

Country	1990		2000		2010	
	Total	per 100 people	Total	per 100 people	Total	per 100 people
Afghanistan	0	0.0	0	0.0	13,000,000	45.8
Albania	0	0.0	29,791	0.9	2,692,372	85.5
Algeria	470	0.0	86,000	0.3	32,780,165	88.4
Azerbaijan	0	0.0	420,400	5.2	9,100,113	100.1
Bahrain	5,147	1.0	205,727	30.8	1,567,000	125.2
Bangladesh	0	0.0	279,000	0.2	67,923,887	44.9
Benin	0	0.0	55,476	0.8	7,074,914	74.4
Brunei Darussalam	1,772	0.7	95,000	28.6	435,104	108.6
Burkina Faso	0	0.0	25,245	0.2	5,707,850	36.7
Djibouti	0	0.0	230	0.0	165,613	19.9
Chad	0	0.0	5,500	0.1	2,875,304	24.5
Cote d'Ivoire	0	0.0	472,952	2.9	15,599,044	82.2
Gabon	0	0.0	120,000	9.8	1,610,000	103.5
Gambia, The	0	0.0	5,600	0.5	1,478,347	88.0
Guinea	0	0.0	42,112	0.5	4,000,000	36.8
Guinea-Bissau	0	0.0	0	0.0	677,365	42.7
Guyana	0	0.0	39,830	5.4	560,397	71.3
Cameroon	0	0.0	103,279	0.6	8,636,652	41.9
Iraq	0	0.0	0	0.0	23,264,408	75.1
Iran, Islamic Rep.	0	0.0	962,595	1.5	54,051,764	72.6
Kazakhstan	0	0.0	197,300	1.4	19,402,600	121.9
Kyrgyz Republic	0	0.0	9,000	0.2	5,275,477	98.9
Comoros	0	0.0	0	0.0	165,278	24.2
Kuwait	20,735	1.0	476,000	25.0	3,979,145	133.0
Lebanon	0	0.0	743,000	23.0	2,863,664	66.0
Libya	0	0.0	40,000	0.8	10,900,000	180.4
Maldives	0	0.0	7,638	2.8	494,351	151.8
Malaysia	86,620	0.5	5,121,748	21.9	33,858,700	119.7
Mali	0	0.0	10,398	0.1	7,440,383	53.2
Mauritania	0	0.0	15,300	0.6	2,776,050	76.9
Egypt, Arab Rep.	4,000	0.0	1,359,900	2.1	70,661,005	90.5
Mozambique	0	0.0	51,065	0.3	7,224,176	30.1
Niger	0	0.0	2,056	0.0	3,668,625	23.1
Nigeria	0	0.0	30,000	0.0	87,297,789	54.7
Oman	2,730	0.2	162,000	7.4	4,606,133	164.3
Indonesia	18,096	0.0	3,669,327	1.8	211,290,235	87.8
Morocco	904	0.0	2,342,000	8.2	31,982,279	101.1
United Arab Emirate	33,578	1.9	1,428,115	47.2	10,926,019	129.4
Uganda	0	0.0	126,913	0.5	12,828,264	37.7

Country	1990		2000		2010	
	Total	per 100 people	Total	per 100 people	Total	per 100 people
Uzbekistan	0	0.0	53,128	0.2	20,952,000	75.5
Qatar	3,811	0.8	120,856	20.4	2,186,447	125.0
Senegal	0	0.0	250,251	2.5	8,343,717	64.4
Saudi Arabia	14,851	0.1	1,375,881	6.8	51,564,375	189.2
Syrian Arab Republic	0	0.0	30,000	0.2	11,696,000	54.3
Somalia	0	0.0	80,000	1.1	648,200	6.7
Sierra Leone	0	0.0	11,940	0.3	2,000,000	34.8
Suriname	0	0.0	41,048	8.8	521,166	99.3
Pakistan	2,000	0.0	306,493	0.2	99,185,844	57.3
Tajikistan	0	0.0	1,160	0.0	5,940,842	77.9
Togo	0	0.0	50,000	1.0	2,602,283	41.3
Jordan	1,439	0.0	388,949	8.2	6,620,000	102.6
Tunisia	953	0.0	119,165	1.2	11,114,206	104.5
Turkmenistan	0	0.0	7,500	0.2	3,197,624	63.4
Yemen, Rep.	0	0.0	32,042	0.2	11,085,000	48.7

Source: WDI database

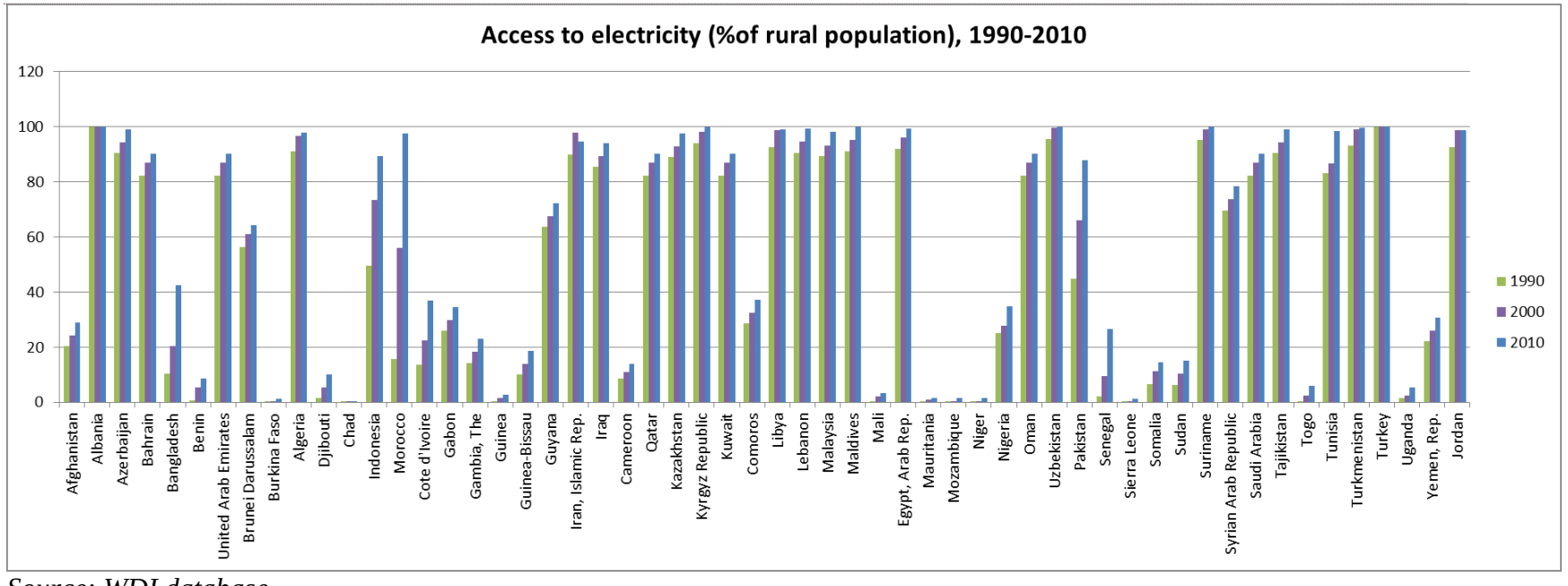
TABLE 1.22 ACCESS TO ELECTRICITY (% OF RURAL POPULATION)

Country	1990	2000	2010	Change (1990-2010)
Afghanistan	20.4	24.3	29.0	8.6
Albania	100.0	100.0	100.0	0.0
Azerbaijan	90.4	94.3	99.0	8.6
Bahrain	82.2	86.9	90.1	7.9
Bangladesh	10.4	20.5	42.5	32.1
Benin	0.7	5.5	8.5	7.8
United Arab Emirates	82.2	86.9	90.1	7.9
Brunei Darussalam	56.4	61.2	64.3	7.9
Burkina Faso	0.1	0.2	1.4	1.3
Algeria	91.0	96.7	97.9	6.9
Djibouti	1.6	5.5	10.2	8.6
Chad	0.1	0.1	0.3	0.2
Indonesia	49.4	73.4	89.4	40.0
Morocco	15.6	56.1	97.4	81.8
Cote d'Ivoire	13.7	22.5	37.0	23.3
Gabon	25.9	29.7	34.6	8.7
Gambia, The	14.3	18.2	22.9	8.6
Guinea	0.1	1.5	2.8	2.7
Guinea-Bissau	10.1	14.0	18.7	8.6
Guyana	63.7	67.6	72.3	8.6
Iran, Islamic Rep.	89.9	97.8	94.5	4.6
Iraq	85.5	89.4	94.1	8.6
Cameroon	8.7	11.0	14.0	5.3
Qatar	82.2	86.9	90.1	7.9
Kazakhstan	88.9	92.8	97.5	8.6
Kyrgyz Republic	94.1	98.0	100.0	5.9
Kuwait	82.2	86.9	90.1	7.9
Comoros	28.6	32.5	37.2	8.6
Libya	92.6	98.6	99.1	6.5
Lebanon	90.6	94.5	99.2	8.6
Malaysia	89.2	93.0	98.0	8.8
Maldives	91.2	95.1	99.8	8.6
Mali	0.1	2.2	3.2	3.1
Egypt, Arab Rep.	91.9	95.9	99.3	7.4
Mauritania	0.1	1.0	1.6	1.5
Mozambique	0.1	0.1	1.7	1.6
Niger	0.2	0.2	1.5	1.3
Nigeria	25.1	27.9	34.9	9.8
Oman	82.2	86.9	90.1	7.9

Country	1990	2000	2010	Change (1990-2010)
Uzbekistan	95.6	99.5	100.0	4.4
Pakistan	44.7	65.9	87.9	43.2
Senegal	2.2	9.6	26.6	24.4
Sierra Leone	0.1	0.1	1.4	1.3
Somalia	6.6	11.3	14.5	7.9
Sudan	6.4	10.3	15.0	8.6
Suriname	95.1	99.0	100.0	4.9
Syrian Arab Republic	69.7	73.6	78.3	8.6
Saudi Arabia	82.2	86.9	90.1	7.9
Tajikistan	90.4	94.3	99.0	8.6
Togo	0.1	2.4	6.1	6.0
Tunisia	83.0	86.7	98.5	15.5
Turkmenistan	93.0	99.0	99.6	6.6
Turkey	100.0	100.0	100.0	0.0
Uganda	1.5	2.4	5.3	3.8
Yemen, Rep.	22.1	26.0	30.7	8.6
Jordan	92.4	98.7	98.7	6.3

Source: WB Sustainable Energy for All database

FIGURE 1.1 ACCESS TO ELECTRICITY (% OF RURAL POPULATION), 1990-2010



Source: WDI database

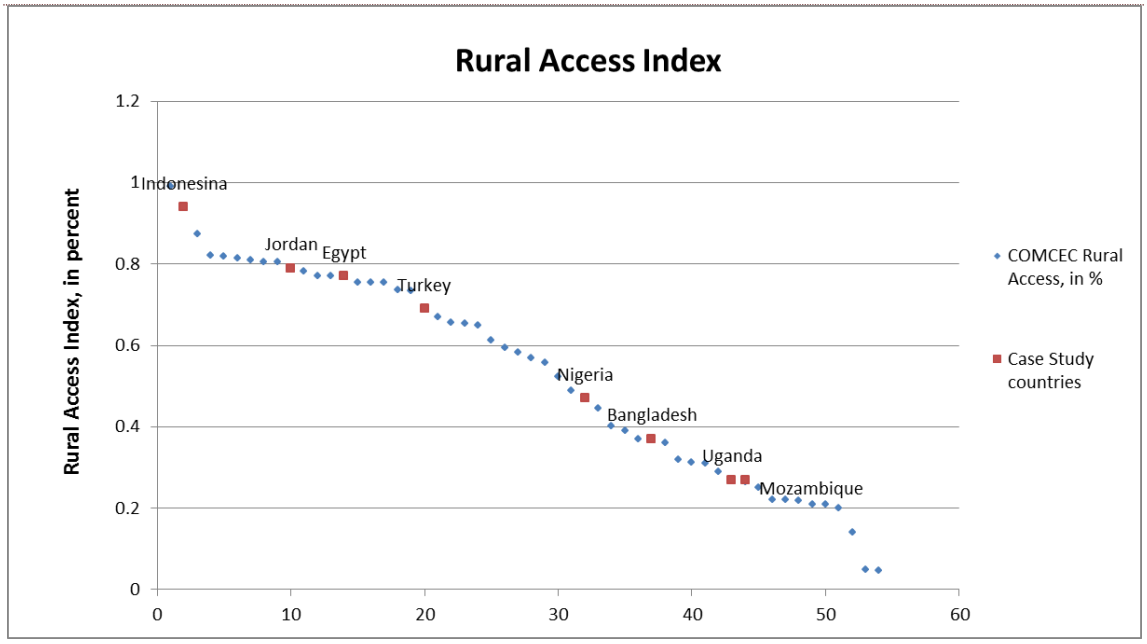
TABLE 1.23 RURAL ACCESS INDEX

Country	Year	Rural Access Index	Rural Population (2004)	Rural Population with Access	Rural Population without Access
Benin	2003	32%	4,925,950	1,576,304	3,349,646
Burkina Faso	2003	25%	10,521,476	2,630,369	7,891,107
Cameroon	2001	20%	7,428,684	1,485,737	5,942,947
Chad	2001	5%	7,093,517	354,676	6,738,841
Comoros	1999	73%	374,167	274,776	99,392
Cote d'Ivoire	1999	56%	9,901,030	5,514,097	4,386,933
Gabon	2000	45%	232,959	103,667	129,292
Gambia, The	1994	77%	695,390	535,450	159,940
Guinea	2004	22%	6,201,986	1,364,437	4,837,549
Guinea-Bissau	1999	52%	1,083,649	566,886	516,764
Mali	2003	14%	9,189,435	1,286,521	7,902,914
Mauritania	1999	31%	1,778,677	556,603	1,222,074
Mozambique	1999	27%	12,870,289	3,410,627	9,459,662
Niger	2003	37%	11,247,202	4,161,465	7,085,737
Nigeria	2002	47%	34,742,392	16,328,924	18,413,468
Senegal	2003	29%	6,672,145	1,931,819	4,740,326
Sierra Leone	2003	65%	3,204,004	2,082,603	1,121,401
Somalia	1999	40%	5,191,205	2,091,958	3,099,247
South Africa	1993	21%	18,740,704	3,935,548	14,805,156
Sudan	1999	5%	21,363,524	985,361	20,378,163
Togo	1999	22%	3,628,958	798,094	2,830,864
Uganda	2003	27%	24,342,986	6,572,606	17,770,380
Brunei Darussalam	1999	81%	98,662	80,257	18,406
Indonesia	2003	94%	115,582,480	108,647,531	6,934,949
Malaysia	2001	82%	8,414,337	6,884,369	1,529,968
Albania	2002	31%	1,721,404	533,635	1,187,768
Azerbaijan	2002	67%	4,038,572	2,705,843	1,332,729
Kazakhstan	2001	77%	6,440,523	4,972,083	1,468,439
Kyrgyz Republic	1998	76%	3,273,653	2,474,882	798,771
Tajikistan	2003	74%	4,826,557	3,557,173	1,269,384
Turkey	2003	69%	23,827,724	16,441,130	7,386,594
Turkmenistan	1999	66%	2,574,598	1,689,566	885,032
Uzbekistan	2000	57%	16,558,881	9,438,562	7,120,319
Algeria	1999	59%	12,101,732	7,181,511	4,920,221
Bahrain	2003	99%	27,774	27,496	278
Djibouti	1999	81%	112,658	90,827	21,831
Egypt, Arab Rep.	1999	77%	41,594,936	31,968,306	9,626,630
Iran, Islamic Rep.	2002	66%	22,540,802	14,769,149	7,771,653
Iraq	1999	58%	7,795,235	4,549,161	3,246,074

Country	Year	Rural Access Index	Rural Population (2004)	Rural Population with Access	Rural Population without Access
Jordan	2003	79%	953,624	755,712	197,911
Kuwait	1999	82%	42,304	34,718	7,586
Lebanon	1999	87%	478,647	418,319	60,329
Libya	1999	78%	892,019	697,254	194,765
Morocco	2003	36%	12,531,921	4,511,492	8,020,429
Oman	1999	81%	721,639	581,602	140,037
Qatar	1999	81%	36,516	29,541	6,975
Saudi Arabia	2000	75%	4,607,987	3,477,968	1,130,018
Syria	2003	49%	9,198,165	4,507,101	4,691,064
Tunisia	2003	39%	3,484,286	1,358,872	2,125,414
United Arab Emirates	1999	76%	1,000,512	755,545	244,967
Yemen, Rep.	1999	21%	14,856,692	3,119,905	11,736,787
Afghanistan	2003	22%	22,122,202	4,848,492	17,273,710
Bangladesh	2000	37%	104,800,696	38,776,258	66,024,438
Pakistan	2004	61%	99,539,304	61,017,593	38,521,711

Source: World Bank Rural Access Index database

FIGURE 1.2 RURAL ACCESS INDEX



Source: World Bank Rural Index Database

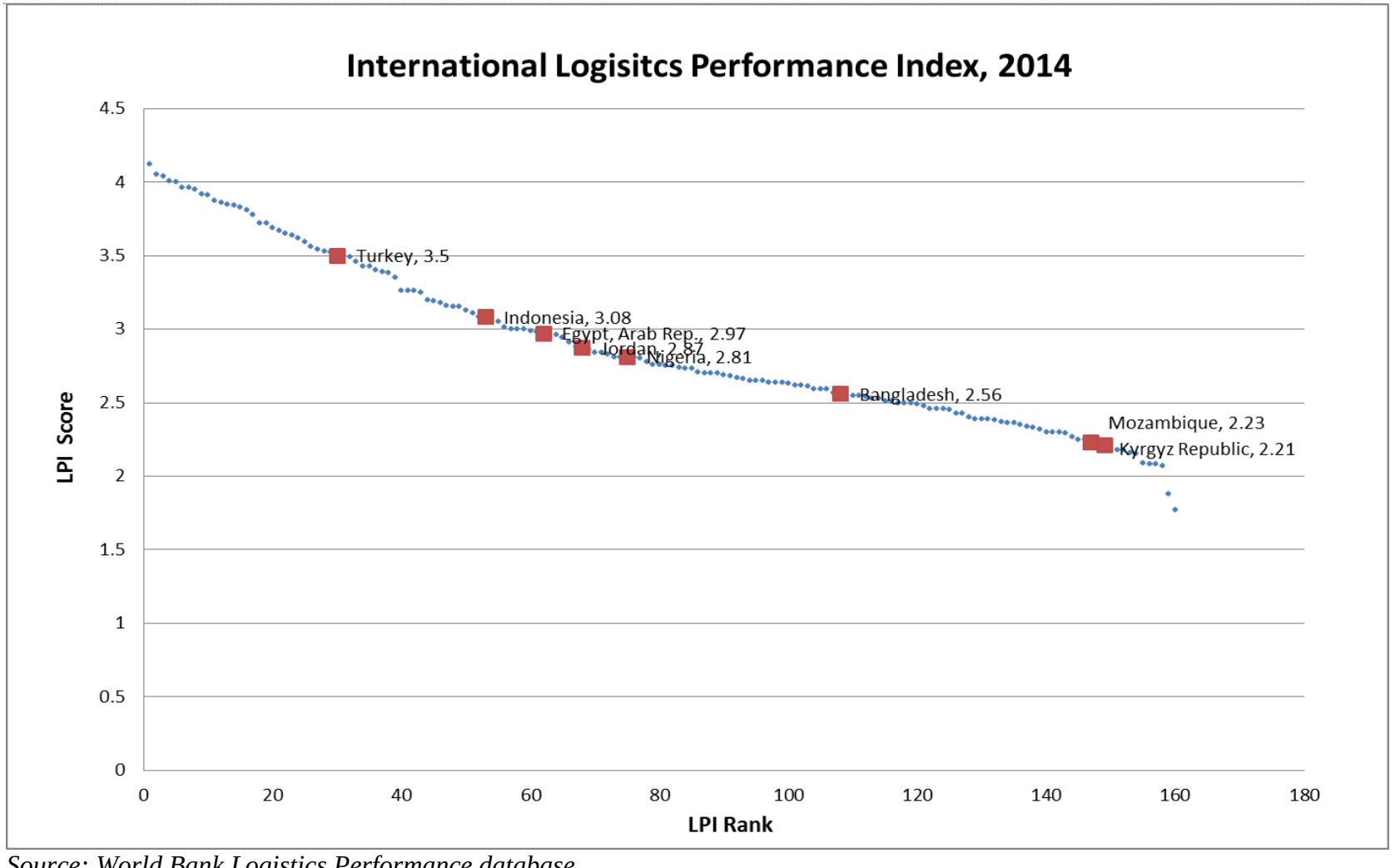
TABLE 1.24 TRADE LOGISTICS RANKINGS (INTERNATIONAL LOGISTICS PERFORMANCE INDEX)

Country	LPI Rank	LPI Score	Customs		Infrastructure		International shipments		Logistics competence		Tracking & tracing		Timeliness	
			Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score
Malaysia	25	3.59	27	3.37	26	3.56	10	3.64	32	3.47	23	3.58	31	3.92
United Arab Emirates	27	3.54	25	3.42	21	3.7	43	3.2	31	3.5	24	3.57	32	3.92
Qatar	29	3.52	37	3.21	29	3.44	16	3.55	28	3.55	32	3.47	34	3.87
Turkey	30	3.5	34	3.23	27	3.53	48	3.18	22	3.64	19	3.77	41	3.68
Saudi Arabia	49	3.15	56	2.86	34	3.34	70	2.93	48	3.11	54	3.15	47	3.55
Bahrain	52	3.08	30	3.29	49	3.04	58	3.04	51	3.04	42	3.29	119	2.8
Indonesia	53	3.08	55	2.87	56	2.92	74	2.87	41	3.21	58	3.11	50	3.53
Kuwait	56	3.01	68	2.69	43	3.16	89	2.76	59	2.96	50	3.16	60	3.39
Oman	59	3	74	2.63	57	2.88	31	3.41	73	2.84	80	2.84	67	3.29
Egypt, Arab Rep.	62	2.97	57	2.85	60	2.86	77	2.87	58	2.99	43	3.23	99	2.99
Jordan	68	2.87	78	2.6	76	2.59	65	2.96	60	2.94	96	2.67	58	3.46
Pakistan	72	2.83	58	2.84	69	2.67	56	3.08	75	2.79	86	2.73	123	2.79
Nigeria	75	2.81	117	2.35	83	2.56	107	2.63	85	2.7	51	3.16	57	3.46
Cote d'Ivoire	79	2.76	120	2.33	101	2.41	75	2.87	95	2.62	67	2.97	64	3.31
Maldives	82	2.75	49	2.95	82	2.56	72	2.92	74	2.79	92	2.7	148	2.51
Lebanon	85	2.73	124	2.29	89	2.53	118	2.53	67	2.89	44	3.22	108	2.89
Kazakhstan	88	2.7	121	2.33	106	2.38	100	2.68	83	2.72	81	2.83	69	3.24
Algeria	96	2.65	66	2.71	87	2.54	117	2.54	102	2.54	109	2.54	94	3.04
Burkina Faso	98	2.64	88	2.5	111	2.35	105	2.63	94	2.63	115	2.49	71	3.21
Senegal	101	2.62	76	2.61	116	2.3	59	3.03	103	2.53	98	2.65	146	2.53
Bangladesh	108	2.56	138	2.09	138	2.11	80	2.82	93	2.64	122	2.45	75	3.18
Benin	109	2.56	73	2.64	109	2.35	99	2.69	123	2.35	123	2.45	115	2.85
Tunisia	110	2.55	146	2.02	118	2.3	73	2.91	120	2.42	124	2.42	80	3.16
Chad	113	2.53	97	2.46	112	2.33	136	2.33	125	2.34	90	2.71	97	3.02
Tajikistan	114	2.53	115	2.35	108	2.36	92	2.73	113	2.47	119	2.47	133	2.74
Libya	118	2.5	104	2.41	119	2.29	140	2.29	131	2.29	78	2.85	114	2.85

Country	LPI Rank	LPI Score	Customs		Infrastructure		International shipments		Logistics competence		Tracking & tracing		Timeliness	
			Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score
Mali	119	2.5	141	2.08	129	2.2	82	2.8	142	2.2	91	2.7	106	2.9
Guinea	122	2.46	119	2.34	141	2.1	125	2.47	124	2.35	126	2.41	86	3.1
Guyana	124	2.46	99	2.46	105	2.4	128	2.43	133	2.27	117	2.47	131	2.74
Azerbaijan	125	2.45	82	2.57	68	2.71	113	2.57	149	2.14	148	2.14	143	2.57
Guinea-Bissau	127	2.43	101	2.43	121	2.29	141	2.29	101	2.57	139	2.29	136	2.71
Comoros	128	2.4	81	2.58	117	2.3	119	2.51	134	2.26	128	2.37	154	2.37
Uzbekistan	129	2.39	157	1.8	148	2.01	145	2.23	122	2.37	77	2.87	88	3.08
Niger	130	2.39	93	2.49	143	2.08	130	2.38	132	2.28	129	2.36	127	2.76
Togo	139	2.32	139	2.09	145	2.07	124	2.47	150	2.14	116	2.49	140	2.6
Turkmenistan	140	2.3	122	2.31	146	2.06	116	2.56	155	2.07	134	2.32	153	2.45
Iraq	141	2.3	149	1.98	131	2.18	139	2.31	147	2.15	136	2.31	116	2.85
Cameroon	142	2.3	156	1.86	154	1.85	147	2.2	104	2.52	111	2.52	120	2.8
Gambia, The	146	2.25	143	2.06	149	2	101	2.67	138	2.22	154	2	151	2.46
Mozambique	147	2.23	126	2.26	135	2.15	154	2.08	153	2.1	152	2.08	134	2.74
Mauritania	148	2.23	152	1.92	103	2.4	155	2.07	157	2.06	142	2.22	130	2.75
Kyrgyz Republic	149	2.21	145	2.03	147	2.05	127	2.43	151	2.13	145	2.2	155	2.36
Gabon	150	2.2	148	2	142	2.08	112	2.58	135	2.25	157	1.92	157	2.31
Yemen, Rep.	151	2.18	159	1.62	153	1.87	134	2.35	141	2.21	144	2.21	124	2.78
Sudan	153	2.16	155	1.87	152	1.9	144	2.23	144	2.18	125	2.42	156	2.33
Djibouti	154	2.15	134	2.2	150	2	158	1.8	140	2.21	155	2	132	2.74
Syrian Arab Republic	155	2.09	142	2.07	144	2.08	150	2.15	159	1.82	158	1.9	145	2.53
Afghanistan	158	2.07	137	2.16	158	1.82	156	1.99	152	2.12	159	1.85	149	2.48
Somalia	160	1.77	147	2	160	1.5	159	1.75	160	1.75	160	1.75	160	1.88

Source: WB Logistics Performance Index database, 2014 International LPI Global Ranking

FIGURE 1.3 INTERNATIONAL LOGISTICS PERFORMANCE INDEX, 2014



Source: World Bank Logistics Performance database

TABLE 1.25 DOING BUSINESS ECONOMY RANKINGS, 2014

Economy	Ease of Doing Business Rank	Starting a Business	Dealing with Construction Permits	Getting Electricity	Registering Property	Getting Credit	Protecting Investors	Paying Taxes	Trading Across Borders	Enforcing Contracts	Resolving Insolvency
Malaysia	6	16	43	21	35	1	4	36	5	30	42
United Arab Emirates	23	37	5	4	4	86	98	1	4	100	101
Saudi Arabia	26	84	17	15	14	55	22	3	69	127	106
Bahrain	46	99	4	52	32	130	115	7	81	122	27
Oman	47	77	69	58	21	86	98	9	47	107	72
Qatar	48	112	23	27	43	130	128	2	67	93	36
Kazakhstan	50	30	145	87	18	86	22	18	186	27	54
Tunisia	51	70	122	55	72	109	52	60	31	78	39
Brunei Darussalam	59	137	46	29	116	55	115	20	39	161	48
Kyrgyz Republic	68	12	66	180	9	13	22	127	182	70	132
Turkey	69	93	148	49	50	86	34	71	86	38	130
Azerbaijan	70	10	180	181	13	55	22	77	168	28	86
Morocco	87	39	83	97	156	109	115	78	37	83	69
Albania	90	76	189	158	119	13	14	146	85	124	62
Maldives	95	71	18	131	161	109	80	115	138	90	40
Kuwait	104	152	133	59	90	130	80	11	112	119	94
Pakistan	110	105	109	175	125	73	34	166	91	158	71
Lebanon	111	120	179	51	112	109	98	39	97	126	93
Guyana	115	94	33	155	111	170	80	110	71	73	141
Jordan	119	117	111	41	104	170	170	35	57	133	113
Indonesia	120	175	88	121	101	86	52	137	54	147	144
Egypt, Arab Rep.	128	50	149	105	105	86	147	148	83	156	146
Bangladesh	130	74	93	189	177	86	22	100	130	185	119
Uganda	132	151	143	178	126	42	115	98	164	117	79
Yemen, Rep.	133	114	101	116	61	170	138	129	128	85	126
Mozambique	139	95	77	171	152	130	52	129	131	145	148
Sierra Leone	142	75	176	179	170	86	22	128	140	149	158
Tajikistan	143	87	184	186	78	159	22	178	188	39	81
Uzbekistan	146	21	159	173	136	130	138	168	189	40	63

Economy	Ease of Doing Business Rank	Starting a Business	Dealing with Construction Permits	Getting Electricity	Registering Property	Getting Credit	Protecting Investors	Paying Taxes	Trading Across Borders	Enforcing Contracts	Resolving Insolvency
Nigeria	147	122	151	185	185	13	68	170	158	136	107
Sudan	149	131	167	113	41	170	157	108	155	154	89
Gambia, The	150	130	104	120	117	165	178	184	99	60	108
Iraq	151	169	20	39	108	180	128	63	179	142	189
Iran, Islamic Rep.	152	107	169	169	168	86	147	139	153	51	129
Algeria	153	164	147	148	176	130	98	174	133	129	60
Burkina Faso	154	125	60	141	123	130	147	160	174	108	117
Mali	155	136	113	118	99	130	147	157	160	140	131
Togo	157	168	114	96	159	130	147	172	110	153	111
Comoros	158	163	44	109	79	159	138	123	146	159	189
Djibouti	160	127	157	144	133	180	182	66	60	163	147
Suriname	161	181	49	40	173	170	186	50	105	184	160
Gabon	163	153	71	138	166	109	157	152	135	157	153
Afghanistan	164	24	167	104	175	130	189	98	184	168	115
Syrian Arab Republic	165	135	189	82	82	180	115	120	147	179	120
Côte d'Ivoire	167	115	162	153	127	130	157	173	165	88	95
Cameroon	168	132	127	62	159	109	128	180	159	175	151
Mauritania	173	173	123	124	67	170	147	181	152	75	189
Benin	174	139	95	160	137	130	157	179	119	181	140
Guinea	175	146	155	91	140	159	178	186	136	134	145
Niger	176	159	164	123	80	130	157	162	178	143	154
Senegal	178	110	165	182	174	130	170	182	80	167	122
Guinea-Bissau	180	159	119	188	170	130	138	153	125	148	189
Libya	187	171	189	68	189	186	187	116	143	150	189
Chad	189	183	139	149	146	130	157	189	183	171	189

Source: World Bank Doing Business Rankings

TABLE 1.26 FOOD BALANCE AVERAGES: FOOD SUPPLY (KCAL/CAPITA/DAY)

COMCEC (all)

item	1980	1990	2000	2009
Cereals	1,220.3	1,322.2	1,339.8	1,414.7
Starchy Roots	165.7	167.1	164.8	171.7
Vegetable Oils	200.6	244.3	258.0	272.2
Vegetables	47.9	51.7	59.6	64.5
Fruits	102.9	102.2	96.5	97.6
Meat	101.0	97.6	116.8	138.5
Milk	106.6	93.3	126.2	141.0
Fish and Seafood	29.2	27.3	27.5	29.6

T2

item	1980	1990	2000	2009
Cereals	1,447.3	1,468.7	1,429.2	1,420.1
Starchy Roots	188.4	166.4	153.0	155.0
Vegetable Oils	182.6	210.9	226.2	241.2
Vegetables	40.0	44.4	54.3	64.9
Fruits	91.7	77.4	77.9	93.6
Meat	58.4	65.4	83.0	118.1
Milk	112.6	111.6	149.0	164.7
Fish and Seafood	16.1	15.9	14.2	17.1

Agriculture based countries

item	1980	1990	2000	2009
Cereals	1045.7	1261.6	1277.8	1394.1
Starchy Roots	224.8	221.5	250.5	244.9
Vegetable Oils	178.8	228.5	229.8	264
Vegetables	16.5	20.9	24.1	22.1
Fruits	34.2	32.1	35.4	37.5
Meat	62.1	61	69.4	72.8
Milk	70.5	59.7	57.9	69.9
Fish and Seafood	41.5	38.75	42.75	52.25

Urbanizing

item	1980	1990	2000	2009
Cereals	1,386.4	1,472.0	1,435.6	1,531.6
Starchy Roots	106.0	115.6	118.8	138.8
Vegetable Oils	265.3	280.0	251.8	246.7
Vegetables	59.8	54.1	69.1	94.3
Fruits	124.9	126.9	111.3	117.7
Meat	99.5	107.5	145.8	173.4
Milk	98.9	92.5	168.3	190.5
Fish and Seafood	35.5	35.3	29.3	26.5

T1

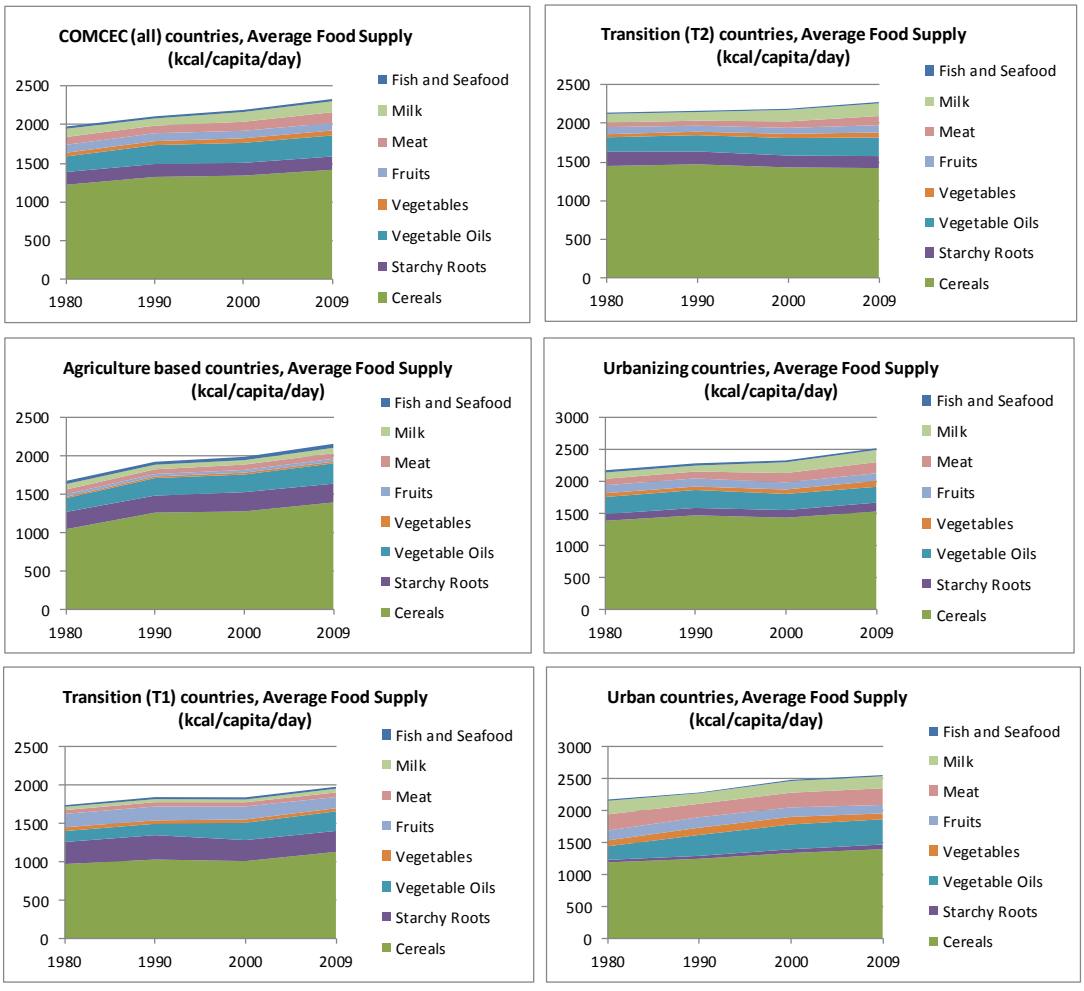
item	1980	1990	2000	2009
Cereals	971.25	1029.75	1009.5	1129.5
Starchy Roots	287	317.5	273.75	272.5
Vegetable Oils	141.75	148	225	255.75
Vegetables	49.25	44.5	43.25	40.25
Fruits	175	179.75	169.25	144.75
Meat	48.75	57.25	55	60.5
Milk	42.75	39.25	35.75	48.75
Fish and Seafood	21.5	26.5	28	25.25

Urban

item	1980	1990	2000	2009
Cereals	1,191.2	1,247.5	1,337.8	1,397.3
Starchy Roots	39.7	45.8	58.8	73.3
Vegetable Oils	211.0	326.3	386.8	394.3
Vegetables	92.7	113.3	118.5	91.2
Fruits	153.3	163.3	148.2	132.0
Meat	252.2	210.0	229.8	261.0
Milk	212.5	164.8	182.0	186.7
Fish and Seafood	20.7	11.5	18.2	19.5

Source: FAOSTAT, FISHSTAT

FIGURE 1.5 FOOD BALANCE AVERAGES: FOOD SUPPLY (KCAL/CAPITA/DAY)



Source: FAOSTAT, FISHSTAT

TABLE 1.27 2011 FINDEX ACCESS TO FINANCE

Country	2011 Loan received in the past year, rural (% age 15+)						Mobile phone used, rural (% age 15+)	
	Loan received, Total	From a financial institution	From a private lender	From an employer	From family or friends	Through store credit	To pay bills	To receive money
Afghanistan	43.4	4.7	6.3	8.8	29.9	9.1	0.0	4.4
Albania	22.7	8.4	0.4	1.4	11.1	2.8	18.1	23.9
Algeria	29.3	2.6	1.0	4.7	23.4	4.1	13.0	31.8
Azerbaijan	55.0	18.3	2.5	5.7	23.6	21.0	0.1	0.1
Bangladesh	36.7	24.5	7.0	0.6	10.6	13.8	1.0	0.9
Benin	34.7	3.6	7.6	1.3	30.6	0.3	0.1	0.3
Burkina Faso	36.1	3.0	3.0	1.0	31.4	1.8	0.3	0.5
Cameroon	50.9	4.7	7.9	1.4	45.3	2.3	0.6	5.9
Chad	40.5	4.8	8.5	10.2	30.7	2.4	2.4	15.6
Comoros	38.2	6.5	1.8	1.7	26.4	7.4	0.3	2.3
Djibouti	17.4	4.1	5.4	2.5	11.5	4.0	3.6	7.6
Egypt, Arab Rep.	30.2	3.5	0.8	0.9	25.3	2.2	0.0	0.4
Gabon	22.8	0.5	0.9	1.1	21.4	0.0	5.3	41.0
Guinea	46.9	2.2	10.0	2.5	37.2	4.0	1.0	3.7
Indonesia	47.3	8.7	2.6	2.6	40.7	4.6	0.2	0.2
Iran, Islamic Rep.	73.8	33.8	5.7	16.1	53.1	37.5	n/a	n/a
Iraq	54.9	10.8	10.0	8.8	39.7	21.1	0.8	4.6
Jordan	23.2	3.2	0.0	2.0	21.8	3.5	0.0	0.0
Kazakhstan	40.0	10.8	4.1	6.4	31.5	8.7	2.2	2.1
Kyrgyz Republic	35.5	12.3	1.5	1.8	25.3	0.7	1.0	0.8
Lebanon	22.8	7.5	1.2	1.2	11.4	5.4	0.5	0.3
Malaysia	33.1	5.5	2.2	7.1	24.5	3.5	0.2	0.1
Mali	28.6	3.2	2.7	1.0	23.5	3.2	0.0	0.5
Mauritania	48.5	10.3	12.6	13.2	38.4	8.6	9.3	20.5
Mozambique	41.5	5.9	2.5	2.8	35.0	2.8	0.9	1.4
Niger	47.1	1.0	8.2	2.9	42.5	3.0	0.1	2.5
Nigeria	48.9	1.8	2.5	2.0	45.5	10.0	1.3	9.6
Oman	47.8	8.8	6.4	12.3	37.3	9.5	n/a	n/a
Pakistan	30.6	0.9	2.9	7.3	24.2	14.4	2.0	1.6
Qatar	57.7	8.5	13.6	30.7	36.7	14.1	n/a	n/a
Saudi Arabia	23.6	2.4	5.3	5.3	13.6	7.8	5.8	1.2
Senegal	28.8	3.2	1.1	1.9	24.2	1.7	0.3	0.7
Sierra Leone	45.0	5.7	5.6	4.3	38.9	1.0	0.6	1.9
Somalia	33.5	1.2	6.6	6.1	24.3	8.9	8.1	13.2
Syrian Arab Republic	61.0	11.4	16.2	12.0	19.8	26.4	0.0	0.0
Tajikistan	31.6	5.0	3.5	3.7	25.7	4.5	28.2	12.7
Togo	24.8	3.3	2.1	0.9	20.2	1.3	0.1	0.5
Tunisia	21.3	3.5	0.7	2.7	16.0	1.0	0.0	0.0
Turkey	63.3	5.4	0.3	1.9	39.2	42.2	6.2	2.1
Turkmenistan	41.4	1.0	2.5	5.4	25.9	24.2	0.0	0.0
Uganda	53.1	9.0	4.6	4.1	46.6	9.6	3.3	24.8
United Arab Emirates	47.5	18.6	9.6	0.0	4.0	18.2	5.4	4.4
Uzbekistan	13.6	1.1	1.1	0.7	11.9	1.0	5.4	0.3
Yemen, Rep.	58.5	0.7	8.8	2.0	46.7	34.3	0.6	1.1
OIC average	*39.4*	*6.7*	*4.8*	*4.8*	*28.3*	*9.3*	*3.1*	*6.0*

Source: Global Financial Inclusion (FINDEX) Database

TABLE 1.28 AGRICULTURAL PRODUCTION, GROSS VALUES (CONSTANT 2004-2006 MILLION US$)

Turkey

Gross Production Value (constant 2004-2006 million US$) (USD)

Item	Average (2010-2012)	Average (1990-1992)
Milk, whole fresh cow	6,525	3,911
Wheat	5,269	2,046
Meat indigenous, cattle	4,095	2,137
Tomatoes	3,556	2,046
Grapes	3,121	2,567
Cotton lint	2,789	1,917
Olives	2,334	1,166
Apples	1,571	1,135
Hazelnuts, with shell	1,367	979
Potatoes	1,305	1,259

Kyrgyzstan

Gross Production Value (constant 2004-2006 million US$) (USD)

Item	Average (2010-2012)	Average* (1990-1992)
Milk, whole fresh cow	222	154
Meat indigenous, cattle	205	179
Potatoes	191	46
Meat indigenous, sheep	127	222
Wheat	102	101
Cotton lint	45	23
Beans, dry	35	1*
Apples	29	10
Tomatoes	22	8
Carrots and turnips	15	2

**Note: data available for 1992 only*

Mozambique

Gross Production Value (constant 2004-2006 million US$) (USD)

Item	Average (2010-2012)	Average (1990-1992)
Cassava	1,184	457
Meat indigenous, pig	668	81
Sweet potatoes	296	19
Maize	252	42
Bananas	163	34
Tomatoes	154	7
Tobacco, unmanufactured	101	5
Rice, paddy	42	10
Sugar cane	34	3
Cashew nuts, with shell	26	10
Pulses, nes	13	5

Nigeria

Gross Production Value (constant 2004-2006 million US$) (USD)

Item	Average (2010-2012)	Average (1990-1992)
Cassava	8,297	4,135
Maize	3,662	2,429
Fruit, citrus nes	3,530	2,251
Sorghum	2,710	2,001
Vegetables, fresh nes	2,603	865
Rice, paddy	2,172	1,407
Cow peas, dry	1,667	888
Cashew nuts, with shell	1,601	83
Groundnuts, with shell	1,581	615
Millet	1,481	1,779
Cocoa, beans	655	449

*Note: *there might be other commodities with bigger production value between Millet and Cocoa beans*

Bangladesh

Gross Production Value (constant 2004-2006 million US$) (USD)

Item	Average (2010-2012)	Average (1990-1992)
Rice, paddy	5,333	3225.66667
Potatoes	1,031	155
Milk, whole fresh goat	503	169
Jute	284	39
Meat indigenous, goat	277	111
Mangoes, mangosteens, g	208	39
Meat indigenous, cattle	181	132
Milk, whole fresh cow	148	133
Fruit, tropical fresh nes	117	30
Vegetables, fresh nes	101	45

Jordan

Gross Production Value (constant 2004-2006 million US$) (USD)

Item	Average (2010-2012)	Average (1990-1992)
Meat indigenous, chicken	306	96
Meat indigenous, sheep	102	51
Olives	91	37
Milk, whole fresh cow	82	28
Tomatoes	78	42
Eggs, hen, in shell	60	41
Cucumbers and gherkins	40	10
Milk, whole fresh sheep	31	19
Potatoes	30	11
Eggplants (aubergines)	18	8
Chillies and peppers, gree	17	5
Lettuce and chicory	9	1

Indonesia

Gross Production Value (constant 2004-2006 million US$) (USD)

Item	Average (2010-2012)	Average (1990-1992)
Rice, paddy	13,823	9,486
Oil, palm	6,103	784
Meat indigenous, chicken	3,421	1,179
Maize	2,799	1,061
Cassava	1,735	1,166
Coconuts	1,700	1,204
Eggs, hen, in shell	1,564	585
Bananas	1,348	562
Rubber, natural	1,316	601
Meat indigenous, pig	1,155	908
Fruit, tropical fresh nes	1,030	412
Palm kernels	917	96

Source: FAOSTAT