

world development report **2008**

*Agriculture for Development*

*Overview*

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## Foreword

Agriculture is a vital development tool for achieving the Millennium Development Goal that calls for halving by 2015 the share of people suffering from extreme poverty and hunger. That is the overall message of this year's *World Development Report (WDR)*, the 30th in the series. Three out of every four poor people in developing countries live in rural areas, and most of them depend directly or indirectly on agriculture for their livelihoods. This Report provides guidance to governments and the international community on designing and implementing agriculture-for-development agendas that can make a difference in the lives of hundreds of millions of rural poor.

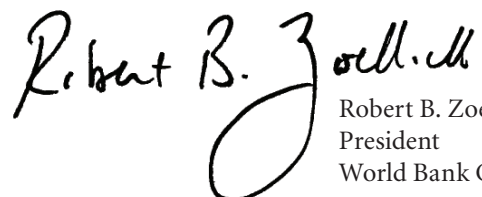
The Report highlights two major regional challenges. In much of Sub-Saharan Africa, agriculture is a strong option for spurring growth, overcoming poverty, and enhancing food security. Agricultural productivity growth is vital for stimulating growth in other parts of the economy. But accelerated growth requires a sharp productivity increase in smallholder farming combined with more effective support to the millions coping as subsistence farmers, many of them in remote areas. Recent improved performance holds promise, and this Report identifies many emerging successes that can be scaled up.

In Asia, overcoming widespread poverty requires confronting widening rural-urban income disparities. Asia's fast-growing economies remain home to over 600 million rural people living in extreme poverty, and despite massive rural-urban migration, rural poverty will remain dominant for several more decades. For this reason, the *WDR* focuses on ways to generate rural jobs by diversifying into labor-intensive, high-value agriculture linked to a dynamic rural, nonfarm sector.

In all regions, with rising land and water scarcity and the added pressures of a globalizing world, the future of agriculture is intrinsically tied to better stewardship of natural resources. With the right incentives and investments, agriculture's environmental footprint can be lightened, and environmental services harnessed to protect watersheds and biodiversity.

Today, rapidly expanding domestic and global markets; institutional innovations in markets, finance, and collective action; and revolutions in biotechnology and information technology all offer exciting opportunities to use agriculture to promote development. But seizing these opportunities will require the political will to move forward with reforms that improve the governance of agriculture.

Ultimately, success will also depend on concerted action by the international development community to confront the challenges ahead. We must level the playing field in international trade; provide global public goods, such as technologies for tropical food staples; help developing countries address climate change; and overcome looming health pandemics for plants, animals, and humans. At stake are the livelihoods of 900 million rural poor, who also deserve to share the benefits of a sustainable and inclusive globalization.

  
Robert B. Zoellick  
President  
World Bank Group

## *Acknowledgments*

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# Overview

An African woman bent under the sun, weeding sorghum in an arid field with a hoe, a child strapped on her back—a vivid image of rural poverty. For her large family and millions like her, the meager bounty of subsistence farming is the only chance to survive. But others, women and men, have pursued different options to escape poverty. Some smallholders join producer organizations and contract with exporters and supermarkets to sell the vegetables they produce under irrigation. Some work as laborers for larger farmers who meet the scale economies required to supply modern food markets. Still others, move into the rural nonfarm economy, starting small enterprises selling processed foods.

While the worlds of agriculture are vast, varied, and rapidly changing, with the right policies and supportive investments at local, national, and global levels, today's agriculture offers new opportunities to hundreds of millions of rural poor to move out of poverty. Pathways out of poverty open to them by agriculture include smallholder farming and animal husbandry, employment in the "new agriculture" of high-value products, and entrepreneurship and jobs in the emerging rural, nonfarm economy.

*In the 21st century, agriculture continues to be a fundamental instrument for sustainable development and poverty reduction.* Three of every four poor people in developing countries live in rural areas—2.1 billion living on less than \$2 a day and 880 million on less than \$1 a day—and most depend on agriculture for their livelihoods.<sup>1</sup> Given where they are and what they do best, promoting agriculture is imperative for meeting the Millennium Development Goal of halving poverty and hunger by 2015 and

continuing to reduce poverty and hunger for several decades thereafter. Agriculture alone will not be enough to massively reduce poverty, but it has proven to be uniquely powerful for that task. With the last World Development Report on agriculture completed 25 years ago, it is time to place agriculture afresh at the center of the development agenda, taking account of the vastly different context of opportunities and challenges that has emerged.<sup>2</sup>

Agriculture operates in three distinct worlds—one agriculture-based, one transforming, one urbanized. And in each the agriculture-for-development agenda differs in pursuing sustainable growth and reducing poverty.

In the agriculture-based countries, which include most of Sub-Saharan Africa, agriculture and its associated industries are essential to growth and to reducing mass poverty and food insecurity. *Using agriculture as the basis for economic growth in the agriculture-based countries requires a productivity revolution in smallholder farming.* Given Sub-Saharan Africa's unique agriculture and institutions, that revolution will have to be different from the Asian green revolution. How to implement it after many years of limited success remains a difficult challenge. But conditions have changed, and there are many local successes and new opportunities on which to build.

In transforming countries, which include most of South and East Asia and the Middle East and North Africa, rapidly rising rural-urban income disparities and continuing extreme rural poverty are major sources of social and political tensions. The problem cannot be sustainably addressed through agricultural protection that raises

the price of food (because a large number of poor people are net food buyers) or through subsidies. *Addressing income disparities in transforming countries requires a comprehensive approach that pursues multiple pathways out of poverty—shifting to high-value agriculture, decentralizing nonfarm economic activity to rural areas, and providing assistance to help move people out of agriculture.* Doing this calls for innovative policy initiatives and strong political commitment. But it can benefit 600 million of the world's rural poor.

In urbanized countries, which include most of Latin America and much of Europe and Central Asia, agriculture can help reduce the remaining rural poverty if smallholders become direct suppliers in modern food markets, good jobs are created in agriculture and agroindustry, and markets for environmental services are introduced.

With rising resource scarcity and mounting externalities, agricultural development and environmental protection have become closely intertwined. *Agriculture's large environmental footprint can be reduced, farming systems made less vulnerable to climate change, and agriculture harnessed to deliver more environmental services.* The solution is not to slow agricultural development—it is to seek more sustainable production systems. The first step in this is to get the incentives right by strengthening property rights and removing subsidies that encourage the degradation of natural resources. Also imperative is adapting to climate change, which will hit poor farmers the hardest—and hit them unfairly because they have contributed little to its causes.

Agriculture thus offers great promise for growth, poverty reduction, and environmental services, but realizing this promise also requires the visible hand of the state—providing core public goods, improving the investment climate, regulating natural resource management, and securing desirable social outcomes. *To pursue agriculture-for-development agendas, local, national, and global governance for agriculture need to be improved.* The state will need greater capacity to coordinate across sectors and to form partnerships with private and civil society actors. Global actors need to deliver

on a complex agenda of interrelated agreements and international public goods. Civil society empowerment, particularly of producer organizations, is essential to improving governance at all levels.

This *Report* addresses three main questions:

- What can agriculture do for development? Agriculture has served as a basis for growth and reduced poverty in many countries, but more countries could benefit if governments and donors were to reverse years of policy neglect and remedy their underinvestment and misinvestment in agriculture.
- What are effective instruments in using agriculture for development? Top priorities are to increase the assets of poor households, make smallholders—and agriculture in general—more productive, and create opportunities in the rural nonfarm economy that the rural poor can seize.
- How can agriculture-for-development agendas best be implemented? By designing policies and decision processes most suited to each country's economic and social conditions, by mobilizing political support, and by improving the governance of agriculture.

### What can agriculture do for development?

#### *Agriculture has features that make it a unique instrument for development*

Agriculture can work in concert with other sectors to produce faster growth, reduce poverty, and sustain the environment. In this *Report*, agriculture consists of crops, livestock, agroforestry, and aquaculture. It does not include forestry and commercial capture fisheries because they require vastly different analyses. But interactions between agriculture and forestry are considered in the discussions of deforestation, climate change, and environmental services.

*Agriculture contributes to development in many ways.* Agriculture contributes to development as an economic activity, as a livelihood, and as a provider of environ-



mental services, making the sector a unique instrument for development.

- **As an economic activity.** Agriculture can be a source of growth for the national economy, a provider of investment opportunities for the private sector, and a prime driver of agriculture-related industries and the rural nonfarm economy. Two-thirds of the world’s agricultural value added is created in developing countries. In agriculture-based countries, it generates on average 29 percent of the gross domestic product (GDP) and employs 65 percent of the labor force. The industries and services linked to agriculture in value chains often account for more than 30 percent of GDP in transforming and urbanized countries.

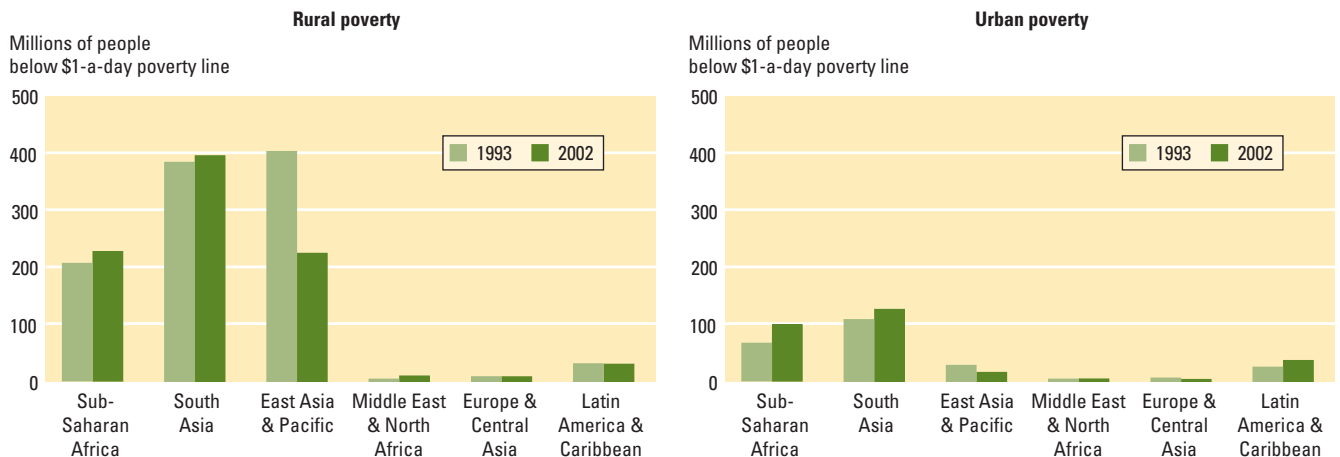
Agricultural production is important for food security because it is a source of income for the majority of the rural poor. It is particularly critical in a dozen countries of Sub-Saharan Africa, with a combined population of about 200 million and with highly variable domestic production, limited tradability of food staples, and foreign exchange constraints in meeting their food needs through imports. These countries are exposed to recurrent food emergencies and the uncertainties of food aid, and for them, increasing and stabilizing domestic production is essential for food security.

- **As a livelihood.** Agriculture is a source of livelihoods for an estimated 86 percent of rural people. It provides jobs for 1.3 billion smallholders and landless workers, “farm-financed social welfare” when there are urban shocks, and a foundation for viable rural communities. Of the developing world’s 5.5 billion people, 3 billion live in rural areas, nearly half of humanity. Of these rural inhabitants an estimated 2.5 billion are in households involved in agriculture, and 1.5 billion are in smallholder households.<sup>3</sup>

The recent decline in the \$1-a-day poverty rate in developing countries—from 28 percent in 1993 to 22 percent in 2002—has been mainly the result of falling rural poverty (from 37 percent to 29 percent) while the urban poverty rate remained nearly constant (at 13 percent). More than 80 percent of the decline in rural poverty is attributable to better conditions in rural areas rather than to out-migration of the poor. So, contrary to common perceptions, migration to cities has not been the main instrument for rural (and world) poverty reduction.

But the large decline in the number of rural poor (from 1,036 million in 1993 to 883 million in 2003) has been confined to East Asia and the Pacific (figure 1). In South Asia and Sub-Saharan Africa, the number of rural poor has continued to

**Figure 1 The number of poor has been rising in South Asia and Sub-Saharan Africa from 1993 to 2002 (\$1-a-day poverty line)**



Source: Ravallion, Chen, and Sangraula 2007.

rise and will likely exceed the number of urban poor until 2040. In these regions, a high priority is to mobilize agriculture for poverty reduction.

- *As a provider of environmental services.* In using (and frequently misusing) natural resources, agriculture can create good and bad environmental outcomes. It is by far the largest user of water, contributing to water scarcity. It is a major player in underground water depletion, agrochemical pollution, soil exhaustion, and global climate change, accounting for up to 30 percent of greenhouse gas emissions. But it is also a major provider of environmental services, generally unrecognized and unremunerated, sequestering carbon, managing watersheds, and preserving biodiversity. With rising resource scarcity, climate change, and concern about environmental costs, business as usual in the way agriculture uses natural resources is not an option. Making the farming systems of the rural poor less vulnerable to climate change is imperative. Managing the connections among agriculture, natural resource conservation, and the environment must be an integral part of using agriculture for development.

*Agriculture's contributions differ in the three rural worlds.* The way agriculture works for development varies across countries depending on how they rely on agriculture as a source of growth and an instrument for poverty reduction. The contribution of agriculture to growth and poverty reduction can be seen by categorizing countries according to the share of agriculture in aggregate growth over the past 15 years, and the current share of total poverty in rural areas, using the \$2-a-day poverty line (figure 2). This perspective produces three types of countries—three distinct rural worlds (table 1):

- *Agriculture-based countries*—Agriculture is a major source of growth, accounting for 32 percent of GDP growth on average—mainly because agriculture is a large share of GDP—and most of the poor are in rural areas (70 percent).

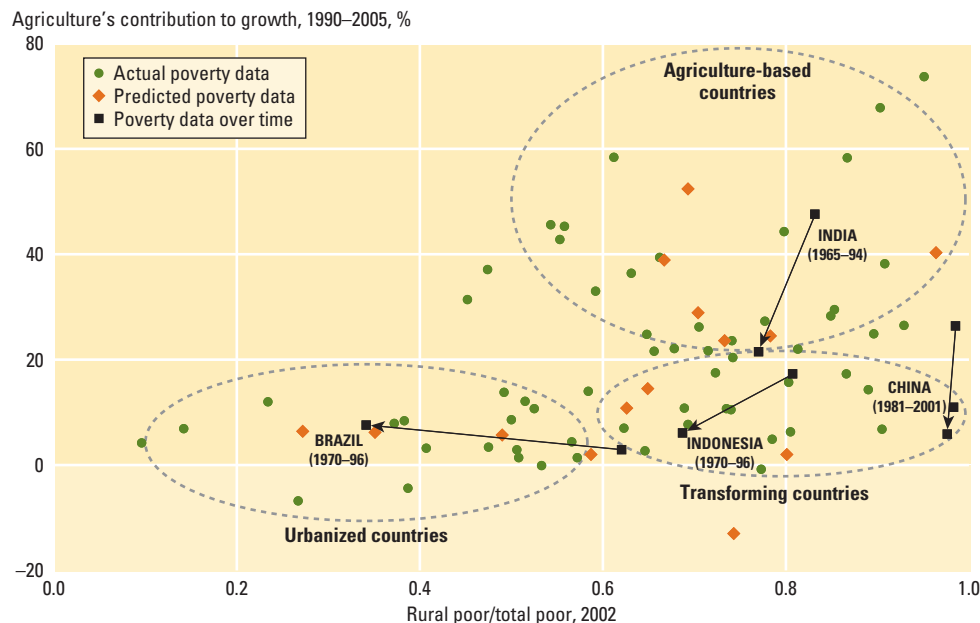
This group of countries has 417 million rural inhabitants, mainly in Sub-Saharan countries. Eighty-two percent of the rural Sub-Saharan population lives in agriculture-based countries.

- *Transforming countries*—Agriculture is no longer a major source of economic growth, contributing on average only 7 percent to GDP growth, but poverty remains overwhelmingly rural (82 percent of all poor). This group, typified by China, India, Indonesia, Morocco, and Romania, has more than 2.2 billion rural inhabitants. Ninety-eight percent of the rural population in South Asia, 96 percent in East Asia and the Pacific, and 92 percent in the Middle East and North Africa are in transforming countries.
- *Urbanized countries*—Agriculture contributes directly even less to economic growth, 5 percent on average, and poverty is mostly urban. Even so, rural areas still have 45 percent of the poor, and agribusiness and the food industry and services account for as much as one third of GDP. Included in this group of 255 million rural inhabitants are most countries in Latin America and the Caribbean and many in Europe and Central Asia. Eighty-eight percent of the rural populations in both regions are in urbanized countries.

Countries follow evolutionary paths that can move them from one country type to another. China and India moved from the agriculture-based to the transforming group over the past 20 years, while Indonesia gravitated toward the urbanized (figure 2). In addition, countries have sharp subnational geographical disparities—for example, many transforming and urbanized countries have agriculture-based regions (such as Bihar in India and Chiapas in Mexico).

Classifying regions within countries according to their agricultural potential and access to markets shows that 61 percent of the rural population in developing countries lives in favored areas—irrigated, humid, and semihumid areas with little moisture stress, and with medium to good market access (less than five hours from a market town of 5,000 or more). But two-

**Figure 2 Agriculture’s contribution to growth and the rural share in poverty distinguish three types of countries: agriculture-based, transforming, and urbanized**



Source: WDR 2008 team.  
 Note: Arrows show paths for Brazil, China, India, and Indonesia.

**Table 1 Characteristics of three country types, 2005**

|  | Agriculture-based countries | Transforming countries | Urbanized countries |
|--|-----------------------------|------------------------|---------------------|
| Rural population (millions), 2005                | 417                         | 2,220                  | 255                 |
| Share of population rural (%), 2005              | 68                          | 63                     | 26                  |
| GDP per capita (2000 US\$), 2005                 | 379                         | 1,068                  | 3,489               |
| Share of agriculture in GDP (%), 2005            | 29                          | 13                     | 6                   |
| Annual agricultural GDP growth, 1993–2005 (%)    | 4.0                         | 2.9                    | 2.2                 |
| Annual nonagricultural GDP growth, 1993–2005 (%) | 3.5                         | 7.0                    | 2.7                 |
| Number of rural poor (millions), 2002            | 170                         | 583                    | 32                  |
| Rural poverty rate, 2002 (%)                     | 51                          | 28                     | 13                  |

Source: Ravallion, Chen, and Sangraula 2007; World Bank 2006y.  
 Note: Poverty line is \$1.08 a day, in 1993 purchasing power parity dollars.

thirds of the rural population in Sub-Saharan Africa lives in less-favored areas defined as arid and semiarid or with poor market access. In five countries with detailed poverty maps, the poverty rate is higher in less-favored areas, but most of the poor live in favored areas. So using agriculture to reduce poverty requires not only investing in less-favored areas to combat extreme poverty, but also targeting the large number of poor in favored areas.

*Heterogeneity defines the rural world.* Economic and social heterogeneity is a defining characteristic of rural areas. Large commercial farmers coexist with smallholders. This diversity permeates the smallholder population as well. Commercial smallholders deliver surpluses to food markets and share in the benefits of expanding markets for the new agriculture of high-value activities. But many others are in subsistence farming, mainly due to low asset endowments and

unfavorable contexts. Consuming most of the food they produce, they participate in markets as buyers of food and as sellers of labor. Membership in these categories is affected not only by asset positions, but also by gender, ethnicity, and social status, as they imply differing abilities to use the same assets and resources in responding to opportunities.

Heterogeneity is found in the rural labor market where there are many low-skill, poorly remunerated agricultural jobs and a small number of high-skill jobs that offer workers pathways out of poverty. It is found in the rural nonfarm economy where low-productivity self- and wage-employment coexists with employment in dynamic enterprises. And it is found in the outcomes of migration, which lifts some of the rural poor out of poverty but takes others to urban slums and continued poverty.

This pervasive heterogeneity in agriculture and rural society has deep implications for public policy in using agriculture for development. A particular policy reform is likely to have gainers and losers. Trade liberalization that raises the price of food hurts net buyers (the largest group of rural poor in countries like Bolivia and Bangladesh) and benefits net sellers (the largest group of rural poor in Cambodia and Vietnam). Policies have to be differentiated according to the status and context of households, taking particular account of prevailing gender norms. Differentiated policies are designed not necessarily to favor one group over the other but to serve all households more cost-effectively, tailoring policies to their conditions and needs, particularly to the poorest. Balancing attention to the favored and less-favored subsectors, regions, and households is one of the toughest policy dilemmas facing poor countries with severe resource constraints.

### *Agriculture has a strong record in development*

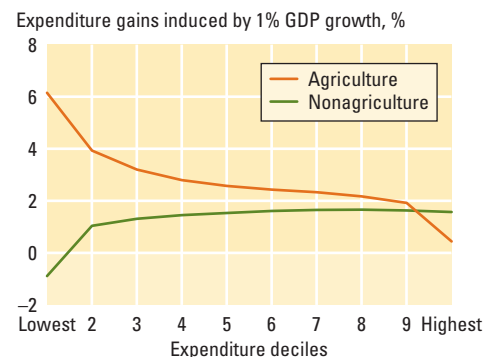
*Agriculture has special powers in reducing poverty.* Agricultural growth has special powers in reducing poverty across all country types. Cross-country estimates show that GDP growth originating in agriculture is at least twice as effective in reducing

poverty as GDP growth originating outside agriculture (figure 3). For China, aggregate growth originating in agriculture is estimated to have been 3.5 times more effective in reducing poverty than growth outside agriculture—and for Latin America 2.7 times more. Rapid agricultural growth—in India following technological innovations (the diffusion of high yielding varieties) and in China following institutional innovations (the household responsibility system and market liberalization)—was accompanied by major declines in rural poverty. More recently, in Ghana, rural households accounted for a large share of a steep decline in poverty induced in part by agricultural growth.

*Agriculture can be the lead sector for overall growth in the agriculture-based countries.* Agriculture has a well-established record as an instrument for poverty reduction. But can it also be the leading sector of a growth strategy for the agriculture-based countries? Besides the sheer size of the sector, two arguments, applied to the agriculture-based countries of Sub-Saharan Africa, support the view that it can.

The first is that in many of these countries, food remains imperfectly tradable because of high transaction costs and the prevalence of staple foods that are only lightly traded, such as roots and tubers and local cereals. So, many of these countries

**Figure 3 GDP growth originating in agriculture benefits the poorest half of the population substantially more**



Source: Ligon and Sadoulet 2007.

Note: Based on data from 42 countries during the period 1981–2003. Gains are significantly different for the lower half of expenditure deciles.

must largely feed themselves. Agricultural productivity determines the price of food, which in turn determines wage costs and competitiveness of the tradable sectors. Productivity of food staples is thus key to growth.

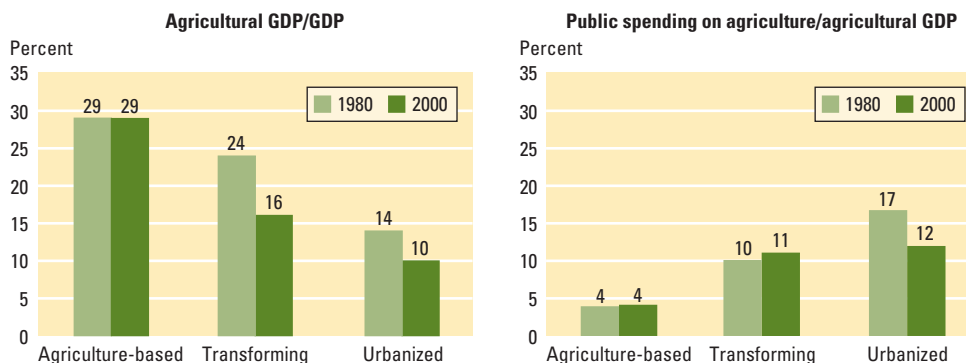
The second is that comparative advantage in the tradable subsectors will still lie in primary activities (agriculture and mining) and agroprocessing for many years, because of resource endowments and the difficult investment climate for manufactures. Most economies depend on a diverse portfolio of unprocessed and processed primary-based exports (including tourism) to generate foreign exchange. Growth in both the nontradable and tradable sectors of agriculture also induces strong growth in other sectors of the economy through multiplier effects.

That is why, for many years to come, the growth strategy for most agriculture-based economies has to be anchored on getting agriculture moving. Success stories of agriculture as the basis for growth at the beginning of the development process abound. Agricultural growth was the precursor to the industrial revolutions that spread across the temperate world from England in the mid-18th century to Japan in the late-19th century. More recently, rapid agricultural growth in China, India, and Vietnam was the precursor to the rise of industry. Just as for poverty, the special powers of agriculture as the basis for early growth are well established.

*Yet agriculture has been vastly underused for development.*

Parallel to these successes are numerous failures to use agriculture for development. Many agriculture-based countries still display anemic per capita agricultural growth and little structural transformation (a declining share of agriculture in GDP and a rising share of industry and services as GDP per capita rises). The same applies to vast areas within countries of all types. Rapid population growth, declining farm size, falling soil fertility, and missed opportunities for income diversification and migration create distress as the powers of agriculture for development remain fallow. Policies that excessively tax agriculture and underinvest in agriculture are to blame, reflecting a political economy in which urban interests have the upper hand. Compared with successful transforming countries when they still had a high share of agriculture in GDP, the agriculture-based countries have very low public spending in agriculture as a share of their agricultural GDP (4 percent in the agriculture-based countries in 2004 compared with 10 percent in 1980 in the transforming countries, figure 4). The pressures of recurrent food crises also tilt public budgets and donor priorities toward direct provision of food rather than investments in growth and achieving food security through rising incomes. Where women are the majority of smallholder farmers, failure to release their full potential in agriculture is a contributing factor to low growth and food insecurity.

**Figure 4 Public spending on agriculture is lowest in the agriculture-based countries, while their share of agriculture in GDP is highest**



Source: Fan, forthcoming.

Underuse of agriculture for development is not confined to the agriculture-based countries. In transforming countries with rapid growth in nonagricultural sectors, the reallocation of labor out of agriculture is typically lagging, leaving large numbers of poor people in rural areas and widening the rural-urban income gap. The farm population demands subsidies and protection. But weak fiscal capacity to sustain transfers large enough to reduce the income gap and continuing urban demands for low food prices create a policy dilemma.<sup>4</sup> The opportunity cost of subsidies (which are three times public investments in agriculture in India) is reduced public goods for growth and social services in rural areas. Raising incomes in agriculture and the rural nonfarm economy must be part of the solution.

*New opportunities are emerging.* The world of agriculture has changed dramatically since the 1982 *World Development Report* on agriculture. Dynamic new markets, far-reaching technological and institutional innovations, and new roles for the state, the private sector, and civil society all characterize the new context for agriculture. The emerging new agriculture is led by private entrepreneurs in extensive value chains linking producers to consumers and including many entrepreneurial smallholders supported by their organizations. The

agriculture of staple crops and traditional export commodities also finds new markets as it becomes more differentiated to meet changing consumer demands and new uses (for example, biofuels) and benefits from regional market integration. However, agriculture faces large uncertainties that are difficult to predict and call for caution in managing the global food supply (box 1).

An emerging vision of agriculture for development redefines the roles of producers, the private sector, and the state. Production is mainly by smallholders, who often remain the most efficient producers, in particular when supported by their organizations. But when these organizations cannot capture economies of scale in production and marketing, labor-intensive commercial farming can be a better form of production, and efficient and fair labor markets are the key instrument to reducing rural poverty. The private sector drives the organization of value chains that bring the market to smallholders and commercial farms. The state—through enhanced capacity and new forms of governance—corrects market failures, regulates competition, and engages strategically in public-private partnerships to promote competitiveness in the agribusiness sector and support the greater inclusion of smallholders and rural workers. In this emerging vision, agriculture assumes a prominent role in the development agenda.

### BOX 1 *What is the future for the global food supply?*

Agriculture has been largely successful in meeting the world's effective demand for food. Yet more than 800 million people remain food insecure, and agriculture has left a huge environmental footprint. And the future is increasingly uncertain.

Models predict that food prices in global markets may reverse their long-term downward trend, creating rising uncertainties about global food security. Climate change, environmental degradation, rising competition for land and water, higher energy prices, and doubts about future adoption rates for new technologies all present huge challenges and risks that make predictions difficult.

To meet projected demand, cereal production will have to increase by nearly 50 percent and meat production by 85

percent from 2000 to 2030. Added to this is the burgeoning demand for agricultural feedstocks for biofuels, which have already pushed up world food prices.

Managing the aggregate response of agriculture to rising demand will require good policy and sustained investments, not business as usual. Sharply increased investment is especially urgent in Sub-Saharan Africa, where food imports are predicted to more than double by 2030 under a business-as-usual scenario, the impact of climate change is expected to be large with little capacity to cope, and progress continues to be slow in raising per capita food availability.

Source: Rosegrant and others 2007.

### What are effective instruments in using agriculture for development?

Agriculture can be the main source of growth for the agriculture-based countries and can reduce poverty and improve the environment in all three country types, albeit in different ways. This requires improving the asset position of the rural poor, making smallholder farming more competitive and sustainable, diversifying income sources toward the labor market and the rural nonfarm economy, and facilitating successful migration out of agriculture.

#### *Increase access to assets*

Household assets are major determinants of the ability to participate in agricultural markets, secure livelihoods in subsistence

farming, compete as entrepreneurs in the rural nonfarm economy, and find employment in skilled occupations. Three core assets are land, water, and human capital. Yet the assets of the rural poor are often squeezed by population growth, environmental degradation, expropriation by dominant interests, and social biases in policies and in the allocation of public goods.

Nowhere is the lack of assets greater than in Sub-Saharan Africa, where farm sizes in many of the more densely populated areas are unsustainably small and falling, land is severely degraded, investment in irrigation is negligible, and poor health and education limit productivity and access to better options. Population pressure together with declining farm size and water scarcity are also major challenges in many parts of Asia. Enhancing assets requires significant public investments in irrigation, health, and education. In others cases, it is more a matter of institutional development, such as enhancing the security of property rights and the quality of land administration. Increasing assets may also call for affirmative action to equalize chances for disadvantaged or excluded groups, such as women and ethnic minorities.

**Land.** Land markets, particularly rental markets, can raise productivity, help households diversify their incomes, and facilitate exit from agriculture. As farmers age, as rural economies diversify, and as migration accelerates, well-functioning land markets are needed to transfer land to the most productive users and to facilitate participation in the rural nonfarm sector and migration out of agriculture. But in many countries, insecure property rights, poor contract enforcement, and stringent legal restrictions limit the performance of land markets, creating large inefficiencies in both land and labor reallocation and reinforcing existing inequalities in access to land. Safety nets and access to credit are needed to minimize distress land sales when farmers are exposed to shocks.

Land reform can promote smallholder entry into the market, reduce inequalities in land distribution, increase efficiency, and be organized in ways that recognize

women's rights. Redistributing underutilized large estates to settle smallholders can work if complemented by reforms to secure the competitiveness of beneficiaries—something that has been difficult to achieve. Targeted subsidies to facilitate market-based land reform are used in Brazil and South Africa, and lessons must be derived from these pioneering experiences for potential wider application.

**Water.** Access to water and irrigation is a major determinant of land productivity and the stability of yields. Irrigated land productivity is more than double that of rainfed land. In Sub-Saharan Africa, only 4 percent of the area in production is under irrigation, compared with 39 percent in South Asia and 29 percent in East Asia. With climate change leading to rising uncertainties in rainfed agriculture and reduced glacial runoff, investment in water storage will be increasingly critical. Even with growing water scarcity and rising costs of large-scale irrigation schemes, there are many opportunities to enhance productivity by revamping existing schemes and expanding small-scale schemes and water harvesting.

**Education.** While land and water are critical assets in rural areas, education is often the most valuable asset for rural people to pursue opportunities in the new agriculture, obtain skilled jobs, start businesses in the rural nonfarm economy, and migrate successfully. Yet education levels in rural areas tend to be dismally low worldwide: an average of four years for rural adult males and less than three years for rural adult females in Sub-Saharan Africa, South Asia, and the Middle East and North Africa. Improving basic rural education has been slower than in urban areas. Where demand for education is lagging among rural households, it can be enhanced through cash transfers (as in Bangladesh, Brazil, and Mexico) conditional on school attendance. However, increasingly it is the quality of rural education that requires the most improvement, with education conceived broadly to include vocational training that can provide technical and business skills that are useful in

the new agriculture and the rural nonfarm economy.

**Health.** Widespread illness and death from HIV/AIDS and malaria can greatly reduce agricultural productivity and devastate livelihoods. The majority of people affected by HIV work in farming, and there is tremendous scope for agricultural policy to be more HIV-responsive in supporting adjustments to labor shocks and the transmission of knowledge to orphans. In rural Zambia, population declines have been especially severe for young rural adults: 19 percent of people 15–24 years old in 1990, the most productive age, are estimated to have died by 2000. But agriculture also poses threats to the health of the rural poor. Irrigation can increase the incidence of malaria, and pesticide poisoning is estimated to cause 355,000 deaths annually. Zoonotic diseases such as avian influenza that arise from the proximity of humans and animals pose growing threats to human health. Better coordination of the agriculture and health agendas can yield big dividends for productivity and welfare.

### ***Make smallholder farming more productive and sustainable***

Improving the productivity, profitability, and sustainability of smallholder farming is the main pathway out of poverty in using agriculture for development. What will this take? A broad array of policy instruments, many of which apply differently to commercial smallholders and to those in subsistence farming, can be used to achieve the following:

- Improve price incentives and increase the quality and quantity of public investment (chapter 4)
- Make product markets work better (chapters 5 and 6)
- Improve access to financial services and reduce exposure to uninsured risks (chapter 6)
- Enhance the performance of producer organizations (chapter 6)
- Promote innovation through science and technology (chapter 7)

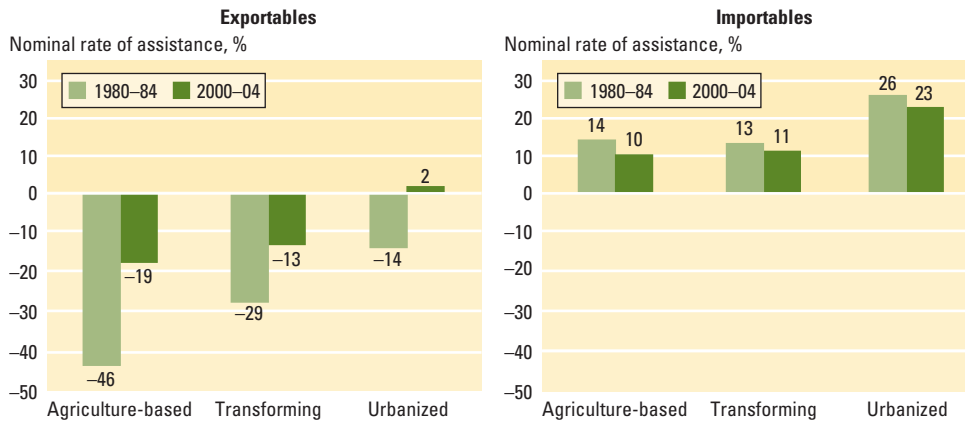
- Make agriculture more sustainable and a provider of environmental services (chapter 8)

***Improve price incentives and increase the quality and quantity of public investment.*** Recent reforms have improved price incentives for agricultural producers in developing countries, reducing but not eliminating historical policy biases against agriculture. Between 1980–84 and 2000–04 net agricultural taxation declined on average from 28 percent to 10 percent in agriculture-based countries, from 15 percent to 4 percent in transforming countries, and from marginally negative protection to net protection of 9 percent in urbanized countries. However, a low level of net taxation hides a combination of protection of importables and taxation of exportables (especially in the agriculture-based and transforming countries), which can both be high (figure 5). Hence, considerable room remains for further efficiency gains through reforms in developing countries' own trade policies. Liberalization of imports of food staples can also be pro-poor because often the largest number of poor, including smallholders, are net food buyers. But many poor net sellers (sometimes the largest group of poor) will lose, and programs tailored to country-specific circumstances will be needed to ease the transition to new market realities.

In sharp contrast, there has been relatively little progress in the overall decline in producer support in member countries of the Organisation for Economic Co-operation and Development (OECD). Producer support declined from 37 percent of gross value of farm receipts in 1986–88 to 30 percent in 2003–05. There has been a shift away from support directly linked to product prices to other less-distorting forms such as cash transfers “decoupled” from production, particularly in the European Union (EU). But such transfers are not always neutral for production because they reduce aversion to risk (wealth effect), reduce the variability in farm income (insurance effect), and allow banks to make loans to farmers that they otherwise would not.



**Figure 5** Developing countries are taxing agricultural exportables less



Source: Anderson, forthcoming.  
 Note: The nominal rate of assistance is a measure of domestic output prices relative to border prices, which also takes into account domestic input subsidies.

The estimated welfare impacts of full trade liberalization are relatively large. By removing their current level of protection, industrial countries would induce annual welfare gains for developing countries estimated to be five times the current annual flow of aid to agriculture. But this impact is heterogeneous across products and countries. With full trade liberalization, international agricultural commodity prices are estimated to increase on average by 5.5 percent, while those of cotton are expected to increase by 21 percent and oilseeds by 15 percent. This raises particular concerns for food-importing countries with tight foreign exchange constraints such as Burundi, Rwanda, and Niger. Poor countries that export cotton or oilseeds, such as Chad, Sudan, Burkina Faso, Mali, and Benin, stand to gain. Among the big expected gainers are Brazil, Thailand, and Vietnam.

The Doha Round of trade negotiations must urgently be concluded, particularly to eliminate distortions, such as U.S. cotton subsidies, which are detrimental to the poorest countries. Complementary policies and programs (including aid-for-trade) are needed to compensate losers (transfer programs) and to facilitate rapid and equitable adjustments by smallholders to emerging comparative advantages (investments in public goods and institutional reforms).

The political economy will determine the pace and extent of further trade, price, and public spending reforms. Membership in the World Trade Organization (WTO) can help induce reform, and local media can expose taxpayer costs and unequal incidence of gains. In some cases, bargained compromises and compensation schemes for the losers can be effective—as in Japan’s rice policy reforms, the EU’s sugar reforms, and Mexico’s 1990s reforms for food staples. Linking domestic agricultural reforms to a broader set of economy-wide reforms can increase the likelihood of success, as in many developing countries in the 1980s and 1990s, but these reforms tend to remain incomplete for agriculture. Other subsidy reforms, such as free electrical power to Indian farmers, remain deadlocked in clientelistic bargains at high efficiency and environmental costs.

The response to better price incentives depends on public investments in market infrastructure, institutions, and support services. But the quality of public spending is often low and needs improvement. In some countries, nonstrategic subsidies amount to as much as half of the public budget for agriculture. To mobilize political support for better use of public expenditures in agriculture, an initial step is greater public disclosure and transparency of budget allocation, and analysis of impacts.

*Make product and input markets work better.* With major structural changes in agricultural markets and the entry of powerful new actors, a key issue for development is enhancing the participation of smallholders and ensuring the poverty-reducing impacts of agricultural growth. Options differ across the spectrum of markets.

*Food staples markets.* Reducing transaction costs and risks in food staples markets can promote faster growth and benefit the poor. Beyond investments in infrastructure, promising innovations include commodity exchanges, market information systems based on rural radio and short messaging systems, warehouse receipts, and market-based risk management tools.

A particularly thorny issue in food markets is how to manage price volatility for politically sensitive food staples in countries where they account for a large share of consumer spending. If the food staple is tradable, insurance through exchange-traded futures contracts can sometimes manage price risks, as for countries or traders in southern Africa that use the South African commodity exchange. Risk management can also be enhanced by more open borders and private trade, as in the successful management of flood-induced rice shortages in Bangladesh in 1998. But most food staples in agriculture-based countries are only partially tradable, and many countries subject to frequent climatic shocks manage public grain reserves to reduce price instability—with mixed success. High risks of price volatility remain for both farmers and consumers in many agriculture-based countries and effective safety nets will continue to be important until incomes rise or market performance improves.

*Traditional bulk exports.* The long downward trend in world market prices of such traditional exports as coffee and cotton threatens the livelihoods of millions of producers. Reduced taxation and greater liberalization of export markets has improved incomes in many settings. But these liberalized markets require a new role for government, particularly in regulating fair and efficient operations in marketing. Where

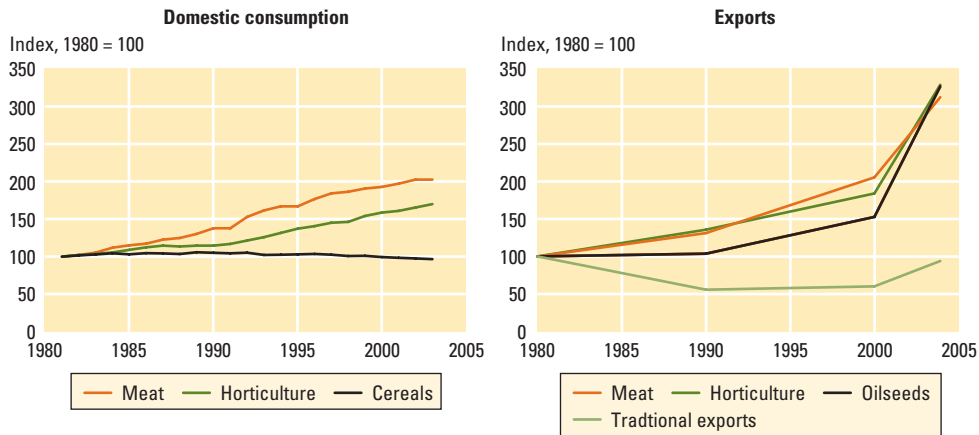
this has been done, production and quality have improved—as for cotton in Zambia, where production tripled. Critically important, too, is to increase the productivity of exports, as exemplified by the recent successful Ghana experience with cocoa. Quality improvements and fair trade can open new opportunities for more remunerative markets for some smallholders.

*High-value markets.* The participation of smallholders can also be enhanced in high-value markets, both global and domestic, including the supermarket revolution unfolding in many countries. High-value markets for domestic consumption are the fastest-growing agricultural markets in most developing countries, expanding up to 6–7 percent a year, led by livestock products and horticulture (figure 6). Fresh and processed fruits and vegetables, fish and fish products, meat, nuts, spices, and floriculture now account for 43 percent of agrofood exports from developing countries, worth about \$138 billion in 2004. As incomes rise, supermarkets become more dominant in the domestic retail sales of agricultural products—reaching 60 percent in some Latin American countries.

The poverty impacts of this growth depend on how the rural population participates in high-value markets, either directly as producers (as in Bangladesh) or through the labor market (as in Chile). Enhancing smallholder participation needs market infrastructure, upgrading farmers' technical capacity, risk management instruments, and collective action through producer organizations. Addressing the stringent sanitary and phytosanitary standards in global markets is an even bigger challenge. Doing it well depends on joint public and private efforts in policy (food safety legislation), research (risk assessment, good practices), infrastructure (export processing facilities), and oversight (disease surveillance).

*Input markets.* Especially for seed and fertilizer, market failures continue to be pervasive in Sub-Saharan Africa because of high transaction costs, risks, and economies of scale. As a result, low fertilizer use is one of the major constraints on increasing agricul-

**Figure 6 Domestic consumption and exports of high-value products in developing countries are growing rapidly**



Source: <http://faostat.fao.org>, accessed June 2007, and <http://comtrade.un.org>.

tural productivity in Sub-Saharan Africa. The renewed interest in fertilizer subsidies needs to focus on sustainable solutions to market failures. “Market-smart” approaches to jump-starting agricultural input markets include targeted vouchers to enable farmers to purchase inputs and stimulate demand in private markets, and matching grants to underwrite selected start-up costs of entry of private distributors to input markets.

Like any subsidies, input subsidies must be used with caution because they have high opportunity costs for productive public goods and social expenditures and they risk political capture and irreversibility. But through the judicious use of subsidies, it is possible to underwrite risks of early adoption of new technologies and achieve economies of scale in markets to reduce input prices. Subsidies need to be part of a comprehensive strategy to improve productivity and must have credible exit options.

**Improve access to financial services and reduce exposure to uninsured risks.** Financial constraints in agriculture remain pervasive, and they are costly and inequitably distributed, severely limiting smallholders’ ability to compete. Financial constraints originate in the lack of asset ownership to serve as collateral (wealth rationing) and in the reticence to put assets at risk as collateral when they are vital to livelihoods (risk rationing). The demise of special credit lines

to agriculture through public programs or state banks has left huge gaps in financial services, still largely unfilled despite numerous institutional innovations.

**Rural finance.** The microfinance revolution, providing access to credit without formal collateral, has opened access to loans for millions of poor people, especially women, but it has not reached most agricultural activities, except in high-turnover activities such as small livestock and horticulture. However, the range of financial products available to the rural poor has broadened to include savings, money transfers, insurance services, and leasing options. With the rise of integrated supply chains and contract farming, financial intermediation through interlinked agents is becoming more common. Information technologies are reducing transaction costs and making loans less costly in rural areas, for example, using agricultural credit cards to purchase inputs or cellular phones to complete banking transactions. Credit reporting bureaus covering microfinance institutions and the lower tier of commercial banks also help smallholders capitalize on the reputations they establish as microfinance borrowers to access larger and more commercial loans. Many of these innovations are still at the pilot stage, requiring evaluation and scaling up to make a real difference for smallholder competitiveness.

*Managing risk.* Exposure to uninsured risks—the result of natural disasters, health shocks, demographic changes, price volatility, and policy changes—has high efficiency and welfare costs for rural households. To manage exposure to these risks, farmers have to forgo activities with higher expected incomes. Selling assets to survive shocks can have high long-term costs because decapitalization (distress sales of land and livestock) creates irreversibilities or slow recovery in the ownership of agricultural assets. In addition, child education and health can suffer long-term consequences when children are taken out of school in response to shocks or are exposed to early periods of malnutrition, leading to intergenerational transfers of poverty.

In spite of multiple initiatives, little progress has been made in reducing uninsured risks in smallholder agriculture. State-managed insurance schemes have proven largely ineffective. Index-based insurance for drought risk, now being scaled up by private initiatives in India and elsewhere, can reduce risks to borrowers and lenders and unlock agricultural finance. However, these initiatives are unlikely to reach a critical mass unless there is some element of subsidy, at the very least to cover start-up costs.

*Enhance the performance of producer organizations.* Collective action by producer organizations can reduce transaction costs in markets, achieve some market power, and increase representation in national and international policy forums. For smallholders, producer organizations are essential to achieve competitiveness. They have expanded remarkably rapidly in number and membership, often in an attempt to fill the void left by the state's withdrawal from marketing, input provision, and credit, and to take advantage of democratic openings allowing greater civil society participation in governance. Between 1982 and 2002 the percentage of villages with producer organizations rose from 8 to 65 percent in Senegal and from 21 to 91 percent in Burkina Faso. The Indian Dairy Cooperatives Network has 12.3 million individual members, many of them

landless and women, and they produce 22 percent of India's total milk supply.

In spite of many successes, producer organizations' effectiveness is frequently constrained by legal restrictions, low managerial capacity, elite capture, exclusion of the poor, and failure to be recognized as full partners by the state. Donors and governments can assist by facilitating the right to organize, training leaders, and empowering weaker members, in particular women and young farmers. However, providing this assistance without creating dependency remains a challenge.

*Promote innovation through science and technology.* Driven by rapidly growing private investment in research and development (R&D), the knowledge divide between industrial and developing countries is widening. Including both public and private sources, developing countries invest only a ninth of what industrial countries put into agriculture R&D as a share of agricultural GDP.

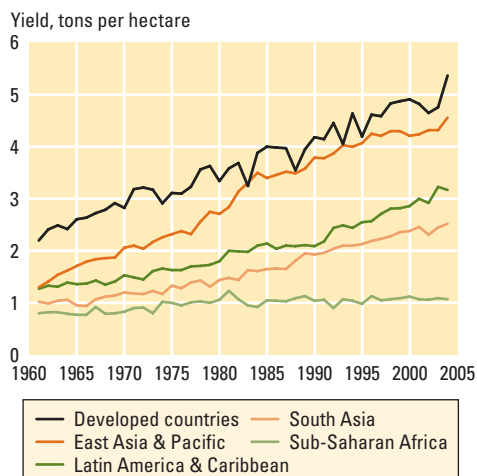
To narrow this divide, sharply increased investments in R&D must be at the top of the policy agenda. Many international and national investments in R&D have paid off handsomely, with an average internal rate of return of 43 percent in 700 R&D projects evaluated in developing countries in all regions. But global and national failures of markets and governance lead to serious underinvestment in R&D and in innovation systems more generally, particularly in the agriculture-based countries. While investment in agricultural R&D tripled in China and India over the past 20 years, it increased by barely a fifth in Sub-Saharan Africa (declining in about half of the countries there).<sup>5</sup> African countries are additionally disadvantaged by the fact that the specificity of their agroecological features leaves them less able than other regions to benefit from international technology transfers and the small size of many of these countries prevents them from capturing economies of scale in agricultural R&D. Low investments in R&D and low international transfers of technology have gone hand in hand with stagnant cereal yields in Sub-Saharan Africa, resulting in a widening

yield gap with the rest of the world (figure 7). For these countries, sharply increased investment and regional cooperation in R&D are urgent.

Low spending is only part of the problem. Many public research organizations face serious leadership, management, and financial constraints that require urgent attention. But higher-value markets open new opportunities for the private sector to foster innovation along the value chain. Grasping them often requires partnerships among the public sector, private sector, farmers, and civil society in financing, developing, and adapting innovation. With a wider range of institutional options now available, more evaluation is needed of what works well in what contexts.

A further challenge is to narrow the income and productivity gaps between favored and less-favored regions. Better technologies for soil, water, and livestock management and more sustainable and resilient agricultural systems, including varieties more tolerant of pests, diseases, and drought, are needed for the latter regions. Approaches that exploit biological and ecological processes can minimize the use of external inputs, especially agricultural chemicals. Examples include conservation tillage, improved fallows, green manure cover crops, soil conservation, and pest control that relies on biodiversity

**Figure 7 The yield gap for cereals between Sub-Saharan Africa and other regions has widened**



Source: <http://faostat.fao.org>, accessed June 2007.

and biological control more than pesticides. Because most of these technologies are location specific, their development and adoption require more decentralized and participatory approaches, combined with collective action by farmers and communities.

Revolutionary advances in biotechnology offer potentially large benefits to poor producers and poor consumers. But today's investments in biotechnology, concentrated in the private sector and driven by commercial interests, have had limited impacts on smallholder productivity in the developing world—the exception is Bt cotton in China and India. Low public investment in biotechnology and slow progress in regulating possible environmental and food safety risks have restrained the development of genetically modified organisms (GMOs) that could help the poor. The potential benefits of these technologies will be missed unless the international development community sharply increases its support to interested countries.

**Make agriculture more sustainable—and a provider of environmental services.** The environmental footprint of agriculture has been large, but there are many opportunities for reducing it. Since the 1992 Earth Summit in Rio, it is generally accepted that the environmental agenda is inseparable from the broader agenda of agriculture for development. And the future of agriculture is intrinsically tied to better stewardship of the natural resource base on which it depends.

Both intensive and extensive agriculture face environmental problems—but of different kinds. Agricultural intensification has generated environmental problems from reduced biodiversity, mismanaged irrigation water, agrochemical pollution, and health costs and deaths from pesticide poisoning. The livestock revolution has its own costs, especially in densely populated and periurban areas, through animal waste and the spread of animal diseases such as avian influenza. Many less-favored areas suffer from deforestation, soil erosion, desertification, and degradation of pastures and watersheds. In the East African

highlands, soil erosion can result in productivity losses as high as 2–3 percent a year, in addition to creating offsite effects such as the siltation of reservoirs.

The answer is not to slow agricultural development, but to seek more sustainable production systems and to enhance agriculture's provision of environmental services. Many promising technological and institutional innovations can make agriculture more sustainable with minimum tradeoffs on growth and poverty reduction. Water management strategies in irrigated areas must improve water productivity, meeting demands of all users (including the environment), and reduce water pollution and the unsustainable mining of groundwater. These strategies depend on removing incentives for wasteful water usage, devolving water management to local user groups, investing in better technologies, and regulating externalities more effectively. Decentralized governance in irrigation management has a higher chance of success if legal frameworks clearly define the roles and rights of user groups and if the capacity of groups to manage irrigation collectively is increased.

Better technologies and better ways of managing modern farm inputs can also make rainfed farming more sustainable. One of agriculture's major success stories in the past two decades is conservation (or zero) tillage. This approach has worked in commercial agriculture in Latin America, among smallholders in South Asia's rice-wheat systems, and in Ghana. In less-favored regions, community-based approaches to natural resource management, such as the watershed management program in Eastern Anatolia of Turkey, offer significant promise. As survey data from 20 countries show, women's active engagement in community organizations improves the effectiveness of natural resources management and the ability to resolve conflicts.

Getting incentives right is the first step toward sustainable resource management. Widespread adoption of more sustainable approaches is often hindered by inappropriate pricing and subsidy policies and the failure to manage externalities. Strength-

ening property rights (as with agroforestry parklands in Niger) and providing long-term incentives for natural resource management with off-farm benefits (such as matching grants for soil conservation) are necessary in both intensive and extensive farming areas. Inappropriate incentives that encourage mining resources—such as subsidies to water intensive crops that cause groundwater overpumping—must be reduced.

Reforms are often politically difficult. Better water measurement through technology (remote sensing), better quality of irrigation services, and greater accountability to water users can generate political support for otherwise stalled reforms.

Payments for environmental services can help overcome market failures in managing environmental externalities. Watershed and forest protection create environmental services (clean drinking water, stable water flows to irrigation systems, carbon sequestration, and protection of biodiversity) for which providers should be compensated through payments from beneficiaries of these services. Interest has been growing, particularly in Latin America. In Nicaragua, payments induced a reduction in the area of degraded pasture and annual crops by more than 50 percent in favor of silvopastoralism, half of it by poor farmers. Environmental certification of products also allows consumers to pay for sustainable environmental management, as practiced under fair trade or shade-grown coffee.

#### *The urgency of dealing with climate change.*

Poor people who depend on agriculture are most vulnerable to climate change. Increasing crop failures and livestock deaths are already imposing high economic losses and undermining food security in parts of Sub-Saharan Africa, and they will get far more severe as global warming continues. More frequent droughts and increasing water scarcity may devastate large parts of the tropics and undermine irrigation and drinking water in entire communities of already poor and vulnerable people. The international community must urgently scale up its support to climate-proof the farming systems of the poor, particularly

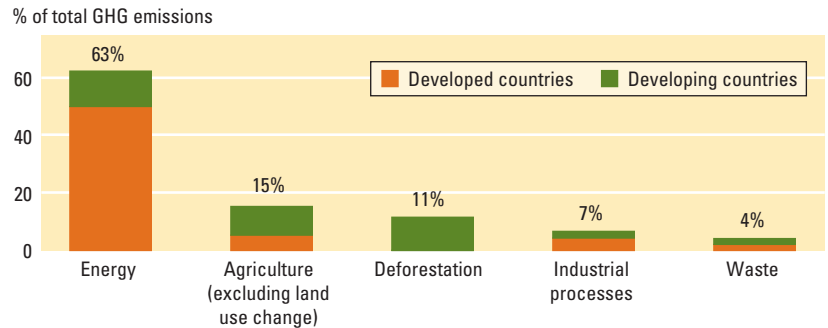
in Sub-Saharan Africa, the Himalayan regions, and the Andes. Based on the polluter-pays principle, it is the responsibility of the richer countries to compensate the poor for costs of adaptation. So far, global commitments to existing adaptation funds have been grossly inadequate.

Developing-country agriculture and deforestation are also major sources of greenhouse gas emissions: they contribute an estimated 22 percent and up to 30 percent of total emissions, more than half of which is from deforestation largely caused by agricultural encroachment (13 million hectares of annual deforestation globally) (figure 8).<sup>6</sup> Carbon-trading schemes—especially if their coverage is extended to provide financing for avoided deforestation and soil carbon sequestration (for example, conservation tillage)—offer significant untapped potential to reduce emissions from land-use change in agriculture. Some improvements in land and livestock management practices (for example, conservation tillage and agroforestry) are often win-win situations: after the initial investments, they can result in more productive and sustainable farming systems.

*Biofuels—an opportunity and a challenge.* Promising new opportunities for mitigating climate change and creating large new markets for agriculture have emerged through the production of biofuels, stimulated by high energy prices. But few of the current biofuels programs are economically viable, and many pose social (rising food prices) and environmental (deforestation) risks. To date, production in industrial countries has developed behind high protective tariffs on biofuels and with large subsidies. These policies hurt developing countries that are, or could become, efficient producers in profitable new export markets. Poor consumers also pay higher prices for food staples as grain prices rise in world markets directly due to the diversion of grain to biofuels or indirectly due to land conversion away from food production.

Brazil is the world's largest and most efficient producer of biofuels, based on its low-cost production of sugarcane. But few other developing countries are likely to be

**Figure 8 Agriculture and deforestation are heavy contributors to greenhouse gas emissions**



Source: WDR 2008 team, based on data from the United Nations Framework Convention on Climate Change, [www.unfccc.int](http://www.unfccc.int).

efficient producers with current technologies. Policy decisions on biofuels need to devise regulations or certification systems to mitigate the potentially large environmental footprint of biofuels production. Increased public and private investment in research is important to develop more efficient and sustainable production processes based on feedstocks other than food staples.

### *Moving beyond farming: a dynamic rural economy and skills to participate in it*

*Creating rural employment.* With rapid rural population growth and slow expansion in agricultural employment, creating jobs in rural areas is a huge and insufficiently recognized challenge. Between 45 and 60 percent of the rural labor force is engaged in the agricultural labor market and the rural nonfarm economy in Asia and Latin America. Only in Sub-Saharan Africa is self-employment in agriculture still by far the dominant activity for the rural labor force, especially for women. But with rapidly growing rural populations and declining farm sizes, the rural employment problem will need to be addressed there as well.

The rural labor market offers employment possibilities for the rural population in the new agriculture and the rural nonfarm sector. But opportunities are better for those with skills, and women with lower education levels are at a disadvantage.

Migration can be a climb up the income ladder for well-prepared, skilled workers, or it can be a simple displacement of poverty to the urban environment for others.

The policy priority is to create more jobs in both agriculture and the rural non-farm economy. The basic ingredients of a dynamic rural nonfarm economy are a rapidly growing agriculture and a good investment climate. Linking the local economy to broader markets by reducing transaction costs, investing in infrastructure, and providing business services and market intelligence are critical. Agro-based clusters—firms in a geographic area coordinating to compete in servicing dynamic markets—have been effective, with well-documented experiences for nontraditional exports in the San Francisco Valley of Brazil and for dairy production in Peru and Ecuador.

The real challenge is to assist the transition of the rural population into higher-paying jobs. Labor regulations are needed that help incorporate a larger share of rural workers into the formal market and eliminate discrimination between men and women. Education, skills, and entrepreneurship can be fostered—by providing incentives for parents to better educate their children, improving the quality of schools, and providing educational opportunities relevant to emerging job markets.

*Providing safety nets.* Providing social assistance to the chronic and transitory poor can increase both efficiency and welfare. Efficiency gains come from reducing the cost of risk management and the risk of asset decapitalization in response to shocks. Welfare gains come from supporting the chronic poor with food aid or cash transfers. In Brazil, South Africa, and most countries in Europe and Central Asia, rural noncontributory pension funds protect the aged, facilitate earlier land transfers to the younger generation, and relieve those who work from the financial burden of supporting the elderly. These policies have been shown to have important spillover effects on the health and education of the pensioners' grandchildren.

Safety nets, such as guaranteed workfare programs and food aid or cash trans-

fers, also have an insurance function in protecting the most vulnerable against shocks. These programs have to be organized so that they do not undermine the local labor market and food economy and do not create work disincentives for beneficiaries, but do reach those most in need “just in time.” With the shift in emphasis of governments and donor programs over the past two decades toward transfers as an instrument for poverty reduction and the greater attention to impact evaluation, much has been learned about how to better target and calibrate these programs for greater effectiveness.

### **How can agriculture-for-development agendas best be implemented?**

Pursuing an agriculture-for-development agenda for a country implies defining what to do and how to do it. What to do requires a policy framework anchored on the behavior of agents—producers and their organizations, the private sector in value chains, and the state. How to do it requires effective governance to muster political support and implementation capacity, again based on the behavior of agents—the state, civil society, the private sector, donors, and global institutions.

### *Defining an agriculture-for-development agenda*

*Opening and widening pathways out of poverty.* Rural households pursue portfolios of farm and nonfarm activities that allow them to capitalize on the different skills of individual members and to diversify risks. Pathways out of poverty can be through smallholder farming, wage employment in agriculture, wage or self-employment in the rural nonfarm economy, and migration out of rural areas—or some combination thereof. Gender differences in access to assets and mobility constraints are important determinants of available pathways.

Making agriculture more effective in supporting sustainable growth and reducing poverty starts with a favorable socio-political climate, adequate governance, and sound macroeconomic fundamentals.



It then requires defining an agenda for each country type, based on a combination of four policy objectives—forming a policy diamond (figure 9):

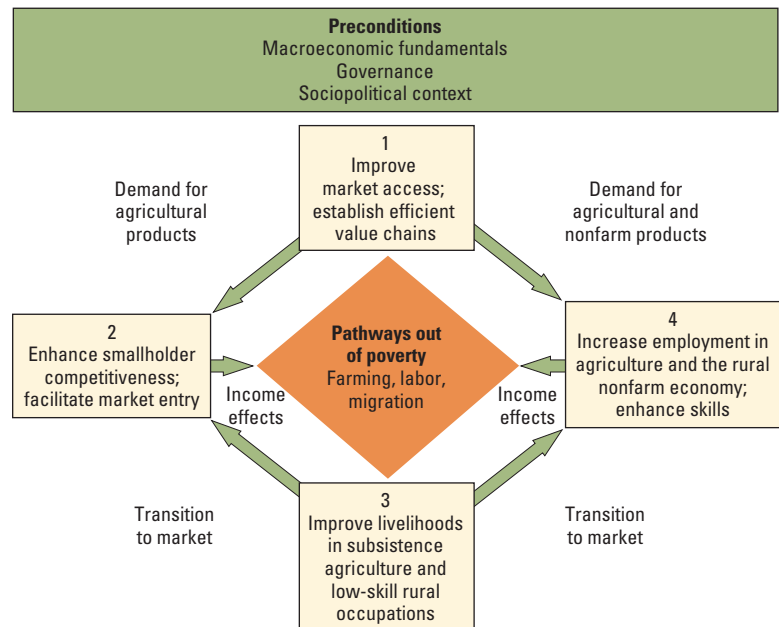
- *Objective 1.* Improve access to markets and establish efficient value chains
- *Objective 2.* Enhance smallholder competitiveness and facilitate market entry
- *Objective 3.* Improve livelihoods in subsistence farming and low-skill rural occupations
- *Objective 4.* Increase employment in agriculture and the rural nonfarm economy, and enhance skills

In using agriculture for development, a country should formulate an agenda with the following characteristics:

- *Established preconditions.* Without social peace, adequate governance, and sound macro fundamentals, few parts of an agricultural agenda can be effectively implemented. This basic premise was all too often missing in agriculture-based countries until the mid-1990s, particularly in Sub-Saharan Africa.
- *Comprehensive.* The agenda combines the four objectives of the policy diamond, depending on country context, and specifies indicators that help in monitoring and evaluating progress toward each policy objective.
- *Differentiated.* Agendas differ by country type, reflecting differences in priorities and structural conditions across the three agricultural worlds. The agendas must be further customized to country specifics through national agricultural strategies with wide stakeholder participation.
- *Sustainable.* The agendas must be environmentally sustainable both to reduce the environmental footprint of agriculture as well as to sustain future agricultural growth.
- *Feasible.* To be implemented and have significant impact, policies and programs must meet the conditions of political feasibility, administrative capacity, and financial affordability.

*Agriculture-based countries: achieving growth and food security.* Sub-Saharan

**Figure 9** The four policy objectives of the agriculture-for-development agenda form a policy diamond

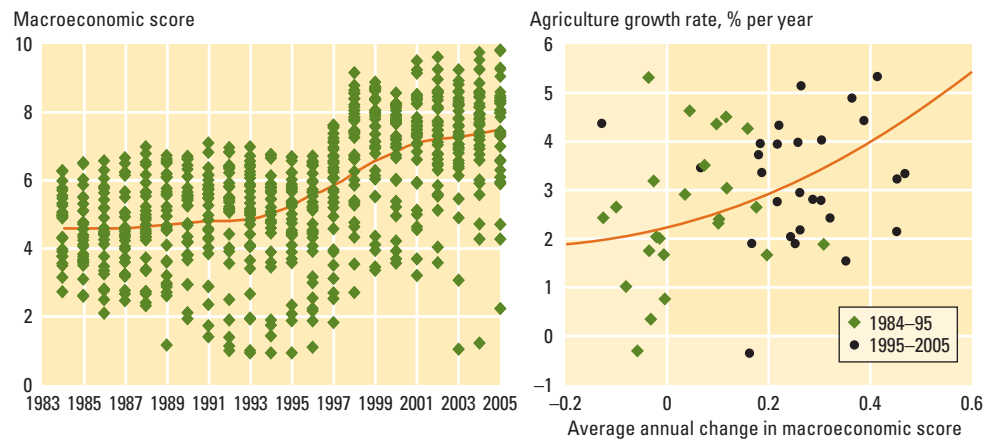


Source: WDR 2008 team.

countries account for over 80 percent of the rural population in the agriculture-based countries. For them, with both limited tradability of food and comparative advantage in primary subsectors, agricultural productivity gains must be the basis for national economic growth and the instrument for mass poverty reduction and food security. This poses a huge challenge to governments and the international community, but there is little alternative to success in this undertaking, and there are new opportunities that provide a basis for optimism.

As macroeconomic conditions and commodity prices improved in Sub-Saharan Africa starting in the mid-1990s (figure 10), agricultural growth accelerated from 2.3 percent per year in the 1980s to 3.8 percent between 2001 and 2005. Rural poverty started to decline where growth occurred—but rapid population growth is absorbing much of the gain, reducing per capita agricultural growth to 1.5 percent. Faster growth and poverty reduction are now achievable, but they will require commitments, skills, and resources.

Diverse local conditions in Sub-Saharan Africa produce a wide range of farming

**Figure 10** Agricultural growth in Sub-Saharan Africa has increased as macroeconomic conditions improved

Source: WDR 2008 team, based on data from International Country Risk Guide, <http://www.icrgonline.com>.

Note: Macroeconomic score is the average of the budget balance score, inflation score, and exchange rate stability. Each point represents a country.

systems and reliance on many types of food staples, implying a path to productivity growth that differs considerably from that in Asia.<sup>7</sup> Although diversity complicates the development of new technologies, it offers a broad range of opportunities for innovation. Dependence on the timing and amount of rainfall increases vulnerability to weather shocks and limits the ability to use known yield-enhancing technologies. But the untapped potential for storing water and using it more efficiently is enormous. Small and landlocked countries acting alone cannot achieve economies of scale in product markets and in research and training, which makes regional integration important. Low population density that increases the cost of providing infrastructure services and loss of human resources because of HIV/AIDS impose additional constraints.

The agenda for Sub-Saharan Africa is to enhance growth by improving smallholder competitiveness in medium and higher potential areas, where returns on investment are highest, while simultaneously ensuring livelihoods and food security of subsistence farmers. Getting agriculture moving requires improving access to markets and developing modern market chains. It requires a smallholder-based productivity revolution centered on food staples but also including traditional and nontraditional exports. Long-term investments in soil and

water management are needed to enhance the resilience of farming systems, especially for people in subsistence farming in remote and risky environments. And it requires capitalizing on agricultural growth to activate the rural nonfarm economy in producing nontradable goods and services. The agenda must recognize the often-dominant role of women as farmers, agroprocessors, and traders in local markets.

The Sub-Saharan context implies four distinct features of an agriculture-for-development agenda. First, a multisectoral approach must capture the synergies between technologies (seeds, fertilizer, livestock breeds), sustainable water and soil management, institutional services (extension, insurance, financial services), and human capital development (education, health)—all linked with market development. Second, agricultural development actions must be decentralized to tailor them to local conditions. These include community-driven approaches with women, who account for the majority of farmers in the region, playing a leading role. Third, the agendas must be coordinated across countries to provide an expanded market and achieve economies of scale in such services as R&D. Fourth, the agendas must give priority to conservation of natural resources and adaptation to climate change to sustain growth.

This agenda will require macroeconomic stability, policies to improve pro-

ducer incentives and trade, and sharply increased public investment—especially in infrastructure, roads, and communications to improve market access, and in R&D to address Africa’s distinct crops and agro-ecologies, as proposed by the New Partnership for Africa’s Development.

The recent surge in growth of Sub-Saharan agriculture has been induced by improved price incentives from macro and sectoral reforms and higher commodity prices. As the easy gains from price reforms have been captured in many countries, future growth will have to rely more on increased productivity. The increased willingness of governments, the private sector, and donors to invest in Sub-Saharan agriculture opens a window of opportunity that should not be missed.

***Transforming countries: reducing rural-urban income disparities and rural poverty.***

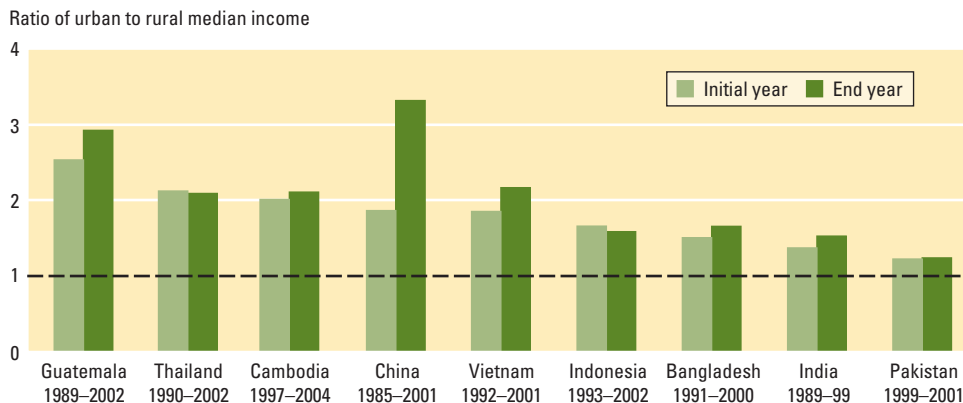
In transforming countries, with 600 million rural poor and 2.2 billion rural inhabitants, nonagricultural sectors have been the fastest growing in the world. The main focus of agriculture for development is to narrow rural-urban income disparities and reduce rural poverty while avoiding the subsidy and protection traps, challenges poorly addressed thus far (figure 11). With growing political attention to widening income disparities, there are strong pressures to better use the powers of agriculture for development.<sup>8</sup>

In these countries, agriculture is almost exclusively in the hands of smallholders.

Continuing demographic pressures imply rapidly declining farm sizes, becoming so minute that they can compromise survival if off-farm income opportunities are not available. Competition over access to water is acute, with rising urban demands and deteriorating quality from runoffs. As nonfarm incomes rise, pressures to address rural-urban income disparities through subsidies would compete for fiscal expenditures, at a high opportunity cost for public goods and rural basic needs. On the other hand, addressing those disparities through import protection would elevate food costs for the large masses of poor consumers who are net food buyers.

Because of demographic pressures and land constraints, the agenda for transforming countries must jointly mobilize all pathways out of poverty: farming, employment in agriculture and the rural nonfarm economy, and migration. Prospects are good for promoting rural incomes and avoiding the subsidy-protection trap, if the political will can be mustered. Rapidly expanding markets for high-value products—especially horticulture, poultry, fish, and dairy—offer an opportunity to diversify farming systems and develop a competitive and labor-intensive smallholder sector. Export markets for nontraditional products are also accessible because transforming countries have a comparative advantage in labor- and management-intensive activities. Many countries have high levels of poverty in less-favored regions

**Figure 11 The urban-rural income disparity has increased in most of the transforming countries**



Source: WDR 2008 team, based on nationally representative household surveys.

that require better infrastructure and technologies adapted to these regions.

To confront rural unemployment, a complementary policy objective is promoting a dynamic rural nonfarm sector in secondary towns, linked to both agriculture and the urban economy. China has brought industry to rural towns, diversifying rural incomes, an approach that could be emulated in other transforming countries. In all transforming countries, the transfer of labor to the dynamic sectors of the economy must be accelerated by massive investments in skills for this generation and the next. The momentous changes this restructuring implies must be insured by effective safety-net programs to allow households to assume risks in moving to their best options. Successfully meeting the disparity problem in transforming countries can make a huge dent in world poverty.

***Urbanized countries: linking smallholders to modern food markets and providing good jobs.*** The broad goal is to capitalize on rapid expansion of modern domestic food markets and booming agricultural subsectors to sharply reduce the remaining rural poverty, still stubbornly high. The urbanized countries, with 32 million rural poor—representing 39 percent of all their poor—are experiencing the supermarket revolution in food retailing. For smallholders, being competitive in supplying supermarkets is a major challenge that requires meeting strict standards and achieving scale in delivery, for which effective producer organizations are essential.<sup>9</sup> Exceptionally high land inequality in Latin America also constrains smallholder participation.

Increasing the access of smallholders to assets, particularly land, and increasing their voice in unequal societies can enhance the size and competitiveness of the smallholder sector. Beyond farming, territorial approaches are being pursued to promote local employment through interlinked farming and rural agroindustry, and these experiences need to be better understood for wider application. Agricultural growth is especially important to improve well-being in geographic pockets

of poverty with good agricultural potential. For regions without such potential, the transition out of agriculture and the provision of environmental services offer better prospects. But support to the agricultural component of the livelihoods of subsistence farmers will remain an imperative for many years.

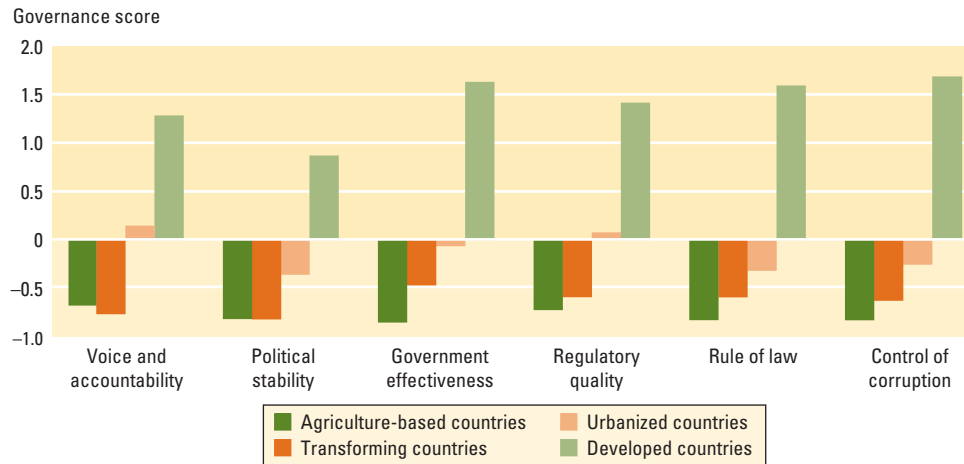
### ***Implementing an agriculture-for-development agenda***

The agriculture-for-development agenda presents two challenges for implementation. One is managing the political economy of agricultural policies to overcome policy biases, underinvestment, and misinvestment. The other is strengthening governance for the implementation of agricultural policies, particularly in the agriculture-based and transforming countries for which governance gets low scores (figure 12).

Insufficient attention to these political economy and governance challenges was a major reason several key recommendations of the 1982 *World Development Report* on agriculture were not fully implemented, particularly those for trade liberalization, increased investments in infrastructure and R&D in Africa, and better delivery of health and education services to rural populations.

***The future offers more promise for agriculture for development.*** The prospects are brighter today than they were in 1982. The anti-agriculture bias in macroeconomic policies has been reduced thanks to broader economic reforms. Agriculture is likely to benefit from other general governance reforms that are now high on the agenda, such as decentralization and public sector management reforms. But reforms specific to using agriculture for development are yet to be widely implemented.

There is also evidence that the political economy has been changing in favor of agriculture and rural development. Both rural civil society organizations and the private sector in agriculture value chains are stronger than they were in 1982. Democratization and the rise of participatory policy

**Figure 12 Agriculture-based and transforming countries get low scores for governance**

Source: Kaufmann, Kraay, and Mastruzzi 2006.

making have increased the possibilities for smallholder farmers and the rural poor to raise their political voice. The private agribusiness sector has become more vibrant, especially in the transforming and urbanized countries. New, powerful actors have entered agricultural value chains, and they have an economic interest in a dynamic and prosperous agricultural sector and a voice in political affairs. Yet these improved conditions alone do not guarantee the more successful use of agriculture for development—smallholders must have their voices heard in political affairs, and policy makers and donors must seize the new opportunities.

*New roles for the state.* Market failures are pervasive, especially in the agriculture-based countries, and there is a need for public policy to secure desirable social outcomes. The state has a role in market development—providing core public goods, improving the investment climate for the private sector—and in better natural resources management by introducing incentives and assigning property rights.

Strengthening the capacity of the state in its new roles of coordinating across sectors and partnering with the private sector and civil society is urgently needed for implementing the agriculture-for-development agendas. In most countries, ministries of agriculture are in need of far-reaching

reforms to redefine their roles and develop new capacities. New models are starting to emerge. Uganda pioneered contracting out agricultural advisory services, giving producer organizations a say in awarding the contracts.

*Strengthening civil society and democracy.* The “third sector”—communities, producer and other stakeholder organizations, and nongovernmental organizations (NGOs)—can improve representation of the rural poor and, in so doing, governance. Producer organizations can give political voice to smallholders and hold policy makers and implementing agencies accountable by participating in agricultural policy making, monitoring the budget, and engaging in policy implementation. In Senegal, the *Conseil National de Concertation et de Coopération des Ruraux*, an umbrella organization of producer organizations, is active in the development and implementation of national agricultural strategies and policies. Freedom of association, a free press, and investment in the social capital of rural organizations, including women’s organizations, are important for such demand-side strategies of improving governance.

*A mix of centralized and decentralized services.* By bringing government closer to rural people, decentralization holds the

potential to deal with the localized and heterogeneous aspects of agriculture, especially for extension. But not all agricultural services should be decentralized, as some such as scientific research and animal disease surveillance have important economies of scale. Decentralized institutions need to address local elite capture and social exclusion, often prevalent in agrarian societies. In India, the reservation of seats for women in local councils has helped better target public investments to gender-specific needs. Elsewhere corruption has been reduced by grassroots monitoring systems, government audits with results diffused by the media, and use of information and communication technologies to keep records and share information.

Community-driven development (CDD) can harness the potential of rural communities—their local knowledge, creativity, and social capital. Decentralization and CDD typically contribute to the agriculture-for-development agenda in a sequenced way, focusing on basic services and public goods first, and engaging in income-generating activities once the most basic needs have been met. Territorial development can help manage economic projects with a broader scale than the CDD approach.

*Improving donor effectiveness.* In the agriculture-based countries, donors are extraordinarily influential. In 24 Sub-Saharan countries, donor contributions represent at least 28 percent of agricultural development spending—and more than 80 percent in some countries. Country-led agricultural strategies and the broader poverty reduction strategies provide a framework for donors to align their support to the agricultural sector and with each other, using the government's public expenditure and procurement systems as mechanisms for program implementation. At the regional level, the Comprehensive Africa Agricultural Development Program provides priorities for coordinating donor investments. Although these national and regional efforts provide the institutional frameworks for donor support to agriculture, progress in implementation has been slow.

*Reforming global institutions.* The agriculture-for-development agenda cannot be realized without more and better international commitments. And the overarching global tasks of the 21st century—ending hunger and poverty, sustaining the environment, providing security, and managing global health—will not be accomplished without agriculture. The global agricultural agenda has a multiplicity of dimensions: establishing fair rules for international trade, agreeing on product standards and intellectual property rights, providing new technologies for the benefit of the poor, avoiding such negative externalities as livestock diseases, conserving the world's biodiversity, and mitigating and adapting to climate change.

With their narrow sectoral focus, the global institutions created for agriculture in the 20th century, despite their many achievements, are inadequately prepared to address today's interrelated and multi-sectoral agendas. Institutional reforms and innovations are needed to facilitate greater coordination across international agencies and with the new actors in the global arena, including civil society, the business sector, and philanthropy.

Implementing the global agenda requires a mix of institutional arrangements. Specialized institutions, such as the Consultative Group on International Agricultural Research, the Food and Agriculture Organization of the United Nations, and the International Fund for Agricultural Development, can provide long-term support and commitment by improving their efficiency and cross-agency coordination. Cross-sectoral, issue-specific networks can react quickly to emergencies, such as controlling avian influenza, and seize emerging opportunities, such as biofortification through nutrient-enhanced crops. In other cases, mainstreaming global priorities, such as adaptation to climate change, into increased donor aid to agriculture may work best. Delivering on the international agenda is a matter not only of self-interest, which extends broadly in a global world, but also of equity and justice between the developed and developing worlds and between present and future generations.

### *What now? Toward implementation*

If the world is committed to reducing poverty and achieving sustainable growth, the powers of agriculture for development must be unleashed. But there are no magic bullets. Using agriculture for development is a complex process. It requires broad consultations at the country level to customize agendas and define implementation strategies. It also requires having agriculture work in concert with other sectors and with actors at local, national, and global levels. It requires building the capacity of smallholders and their organizations, private agribusiness, and the state. It requires institutions to help agriculture serve development and technologies for sustainable natural resource use. And it

requires mobilizing political support, skills, and resources.

There is growing recognition among governments and donors that agriculture must be a prominent part of the development agenda, whether for delivering growth in the agriculture-based countries or for reducing rural poverty and addressing the environmental agenda everywhere. Today's improved opportunities and greater willingness to invest in agriculture provide optimism that agriculture-for-development agendas can move forward. The window of opportunity that this offers should not be missed because success will provide high payoffs toward the Millennium Development Goals and beyond.

### Notes

1. The latest world rural poverty figures are for 2002.
2. World Bank 1982.
3. For much of the developing world, smallholders are defined as operating a farm of 2 hectares or less.
4. Hayami 2005.
5. Pardey and others 2006.
6. The best estimate of the contribution of emissions from land-use change (mainly from deforestation) is 20 percent, with a likely range from 10 percent to 30 percent (Watson and others 2000).
7. Staatz and Dembele 2007.
8. Vyas 2007.
9. Reardon and Berdegué 2006.

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