Continuing progress in agriculture is of vital importance to the developing world for several reasons:

- Close to two-thirds of the population draws its livelihood from agriculture as farmers and farm workers. These groups include the vast majority of the world's poorest people.

- Driven by population and income growth, the demand for food in the developing economies is likely to increase by at least a third over the next decade. If more rapid progress is made in raising the incomes of lower-income groups and in low-income economies, the increase could be much sharper.

- Agricultural exports accounted for 30 percent of the developing countries' total merchandise export earnings in the late 1970s. Agricultural exports are still the main category of exports for over two-thirds of these countries. Export earnings finance imports needed for faster growth, and good export performance enhances access to international capital markets.

- Finally, structural interdependence and complementarity between agriculture and other sectors suggest that weak performance in agriculture will be accompanied by weak growth elsewhere in the economy. This is most important in the low-income, predominantly rural economies, but the evidence reviewed in Chapter 5 suggests the linkages are strong over a wide range of country conditions. Among the more vivid demonstrations is the experience of most sub-Saharan African countries in the 1970s, where poor agricultural performance contributed heavily to economy-wide deterioration.

There has been impressive progress in agriculture in developing countries over the past three decades. It has been supported by major research efforts applied to food crops in the developing world. The results of this research have already moved from laboratories and experimental plots to millions of farms in dozens of countries. New seeds, combined with irrigation water and fertilizer, have boosted yields and production of staple foods. Dubbed the Green Revolution, this progress is already widely known. It has transformed the lives and prospects of millions, and spurred new research.

For all its achievements, the Green Revolution has not yet occurred in many parts of the world. Agricultural growth has varied widely among the main regions of the developing world, among individual countries within each region, and among areas within each country. In some it has been spectacular, in others non-existent. When the results are added up they leave no room for complacency, particularly when they are set alongside the rise in population: while agricultural output grew at just under 3 percent a year in the 1960s and 1970s, it barely kept ahead of population growth. Output per capita increased at only 0.4 percent a year. That average conceals sharp differences, because growth ranged from 1.4 percent a year in South Asia and 0.6 percent a year in Latin America to little or nothing in the low-income countries. In South Asia as a whole, the growth of agricultural output just kept pace with population; in Africa, output per capita grew at 0.2 percent a year during the 1960s, but actually declined by 1.4 percent a year in the 1970s.

Agriculture and economic growth

In the middle-income countries the structural transformation from an agrarian to an industrial economy is well advanced. Agricultural progress is helping, and being helped by, growth in the rest of the economy. More and more of these countries are about to reach an important milestone—the beginning of decline in their agricultural labor force, which will usher in the prospect of more rapid increase in the productivity
and incomes of their farmers. In the low-income countries, agriculture is an even bigger influence on overall economic growth, because it accounts for a much larger share of GNP. In these countries, a major challenge for the international community and national governments alike is to achieve agricultural growth rates higher than those of the population. This holds out the best hope for both reducing poverty and increasing overall economic growth.

For many years, the causes of agricultural growth were controversial and little understood. That is no longer so. Evidence and experience now support certain key propositions about the role of governments and of farmers themselves in encouraging this growth. Starting with farmers, it can confidently be said that:

- All farmers—small, medium, and large—respond to economic incentives. Far from being "tradition-bound peasants," farmers have shown that they share a rationality that far outweighs differences in their social and ecological conditions. In largely market-oriented economies such as Brazil and Kenya, as well as in centrally planned economies such as China and Hungary, farmers have responded to economic incentives. In some instances, their response exceeded the expectations of policymakers. Farmers in the irrigated areas of South Asia responded dramatically to the new incentives provided by the Green Revolution. In dryland areas of Nigeria, farmers showed that they were more aware of constraints and opportunities than the project staff who were planning new schemes for them.

- Farmers contribute to agricultural investment. All of them, even those farming only a few acres, save a substantial part of any extra income and invest it on their farms. They also use their own and their families' labor to level land, grow trees, dig ditches, and build paddy terraces—activities that create capital to produce more agricultural output in the future. In Pakistan, for example, more water for irrigation comes from privately installed tubewells than from publicly built reservoirs.

- Small farmers can be highly productive. Typically, they produce more from each acre than large farmers do, despite the often considerable disadvantages of their limited access to services, markets, and production inputs such as fertilizer. Programs and policies dealing with these problems thus offer substantial economic benefits, as well as increased employment and incomes among the poor.

Given incentives and the means to take advantage of them, therefore, farmers will expand output. That does not mean that governments and other official agencies should confine themselves solely to fixing those incentives. There are several things that farmers cannot do on their own and that therefore require public action:

- Research and technology need to be developed and adapted to local conditions. The lack of technological improvements suitable for African conditions is a main reason for Africa's poor performance so far.

- Rural development programs have helped overcome obstacles to increased agricultural output and have also benefited the poor. However, rural projects need to minimize their demands on scarce administrative and managerial skills in developing countries. The most effective projects are likely to be simply designed, and to involve local farmers in their conception and execution.

- Major investments in irrigation, transport, and marketing networks are needed.

- Where little agricultural progress has been made, it is sometimes because of an adverse agrarian structure inherited from the past. Northeast Brazil is only one area where landless laborers and small farmers are underemployed, while extensive tracts of land are underutilized on large farms. In several countries, land reform has played a valuable role in raising agricultural output. In all countries, security of tenure is important—without this farmers are reluctant to improve the land and to husband its long-term fertility.

Government intervention in marketing and input supply may be essential at the early stages of development, but it has frequently been counterproductive when allowed to monopolize these functions. Experience suggests that in mixed economies, the private sector can usually be encouraged to take on a major part of these activities, with government primarily exercising a regulatory role.

Policy priorities

The past therefore provides a clear guide for the future: the constraints on agricultural growth do not lie in the behavior of farmers; they are not unwilling to work hard, to adopt profitable innovations, or to invest for the future. Instead, the constraints are to be found in the environment in which farmers operate: the technology available to them, their access to land, the incentives for production and investment, the availability and price of materials such as fertilizer, the provision of irrigation, and possibilities for marketing their output. This section reviews some of the main policy issues in these areas.
Technology

Government-supported agricultural research in the industrial countries began in the middle of the nineteenth century. By contrast, systematic research on food crops in the developing world began only during the past three decades. Apart from China, whose research work was indigenous, developing countries have relied on a mixture of international and local efforts. That will continue to be the case. An appropriate strategy involves strengthening and expanding the present network of international research centers to cover more crops and more ecological conditions. The smallest and poorest countries—those with least capacity to conduct agricultural research—are most dependent on the international research effort. In all developing countries, national research needs to expand considerably. Its emphasis will be on adapting new varieties to local conditions and increasing their immunity to diseases and insects.

Many countries, especially in Africa, still lack effective research institutes on the scale they need. Remedying this will require assistance from both multilateral and bilateral donors. In addition, it is imperative that donor countries expand their support for the Consultative Group for International Agricultural Research (CGIAR). The CGIAR's progress has recently been slowed down by the unwillingness of donors to increase their contributions.

Incentives to producers

It is primarily the responsibility of governments to ensure that the prices of agricultural products and supplies are not distorted in a way that inhibits the growth of output and incomes. This is not to say that agriculture should not be taxed or that its supplies should be subsidized—quite the contrary. In low-income countries, especially, agriculture provides the main tax base. Farmers must therefore contribute to help finance many government activities—not least the investments in infrastructure and irrigation from which they themselves benefit. For commodities such as tea, coffee, and cocoa—which are produced mainly for export, and for which demand is more sensitive to quality than to price—it makes sound economic sense for governments to impose export taxes.

Thus the issue is not whether to tax agriculture, but how and how much. There are no fixed and simple answers to this question, although experience and research is starting to provide some guidelines on appropriate levels and forms of agricultural taxation. For example, export taxes on tropical beverages have clearly been set too high in a number of African countries, where production has stagnated or even declined, and market shares have been lost to other exporters.

Frequently, it is macroeconomic policies, rather than those that apply narrowly to agriculture, that give rise to inadequate incentives. A common failing is overvalued exchange rates, which reduce the prices that farmers receive for exported crops and, at the same time, make it cheaper to import agricultural products. The exchange rates thus exert pervasive downward pressure on the prices received by farmers. Bringing exchange rates into line with actual conditions in markets is critical for appropriate agricultural pricing.

Though they can influence or determine domestic prices, governments of developing countries have little or no control over international prices. Too often these are set artificially low because of the extra output produced by subsidized farmers behind protective barriers in industrial countries. Too often, also, prices fluctuate more than would be expected from supply and demand shifts, because an excessive share of market adjustment is forced on the international market by national policies which insulate domestic markets from it. Removing such distortions would increase the incentives to farmers in developing countries. It would also stimulate more rapid overall economic growth, because so many developing countries still depend heavily on agricultural exports.

As to the prices of agricultural inputs, the bulk of experience cautions against subsidies. Subsidized fertilizer prices may well encourage farmers to adopt fertilizer-using cultivation methods more rapidly than they would otherwise, but that is not a sufficient reason for subsidies. New practices that offer high economic returns are rapidly adopted by farmers, even without subsidies. And once instituted, subsidies are politically difficult to lower or remove. Credit also is often subsidized, in some instances at negative real interest rates. Such a policy may stimulate investment in agriculture, but it is all too often of the wrong kind: subsidized interest rates lower the effective cost of capital goods and lead to labor-displacing investments that are not warranted where labor is plentiful and capital scarce. In any case, subsidized credit seldom reaches small farmers, since it is generally preempted by the larger and more influential ones.

Agricultural investment

Continued agricultural progress depends in part on additional public sector investment in agricultural development programs.
Their economic returns are high, though they could still be increased. For example, there is considerable evidence that water is wasted because irrigation schemes are badly designed and poorly managed. These weaknesses were discussed in Chapter 6; putting them right is largely the responsibility of national governments.

New transport facilities that reach down to the village level open new markets to farmers and give them access to modern inputs at lower costs. Improved transport has a direct effect: it increases the farm-gate prices of crops and reduces those of inputs because transport costs are reduced. It also has an indirect effect: more traders visit accessible villages than remote ones; thus the influence of local monopolies is reduced and farmers' prices are improved.

Transport infrastructure can be constructed and maintained in a variety of ways. Some require large infusions of expensive foreign equipment, others utilize abundant local labor. China is noted for its success in mobilizing local labor for creating rural public works, but lesser-known, efficient examples come from such diverse cultures as Indonesia, India, the Republic of Korea, and Sri Lanka.

While many countries have proclaimed agriculture and rural development to be the cornerstone of national development plans, it is striking that most developing countries have allocated only about 5 to 10 percent of their government budgets to agriculture in recent years. Even sub-Saharan African countries mostly fall in this range, in spite of the importance of agriculture in their economies. In these countries, however, larger expenditures on education have been necessary to make up for the past and to keep pace with the rapid growth in the number of children.

Little analysis has been done of the aggregate economic returns to government expenditures in agriculture. Project experience indicates, however, that returns to agriculture are, by and large, as high as in other sectors. In some countries, indeed, they are substantially higher. It is hard to avoid the conclusion that the relative priorities of the different sectors need to be reconsidered in low-income countries, if their growth in agricultural output is to be improved.

Industrial countries also have a big contribution to make to agricultural investment in developing countries. In real terms, official assistance to agriculture more than doubled from 1973 to 1978, when it reached about $10.4 billion (in 1979 prices). Since then, it has declined to slightly below $10 billion in 1979 and 1980. Donor governments are conscious that their public spending options are limited. Aid to their domestic agriculture, however, is typically eight- to tenfold greater than their agricultural development assistance.

Prospects

The coming increase in demand for food has profound implications that go well beyond agriculture itself. Currently only about 8 percent of the food eaten in developing countries, and 9 percent of all agricultural products available in those countries, is supplied by imports. Few countries could see these ratios increase rapidly without encountering severe balance of payments problems. To meet the growth in demand for food, they will need to supply the bulk of it themselves.

Whether they can meet this challenge is a critical question for the future of hundreds of millions of people. If the past is any guide, policy improvements could achieve dramatic results. The rise in agricultural output over the past two decades has confounded the predictions of widespread famine which were common in the 1950s and 1960s. It has also disproved the Malthusian notion that agricultural growth is subject to iron laws beyond the control of people. If agricultural technologies can be improved, additional resources mobilized, and appropriate policies adopted in industrial and developing countries, then faster agricultural growth will be achieved. Economic development, particularly of the poorer countries, will speed up. And poverty will be reduced.