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Food, Agriculture,
and the Environment
Discussion Paper 21

Challenges to the 2020 Vision for Latin America: Food and Agriculture Since 1970

James L. Garrett

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“A 2020 Vision for Food, Agriculture, and the Environment” is an initiative of the International Food Policy Research Institute (IFPRI) to develop a shared vision and a consensus for action on how to meet future world food needs while reducing poverty and protecting the environment. It grew out of a concern that the international community is setting priorities for addressing these problems based on incomplete information. Through the 2020 Vision initiative, IFPRI is bringing together divergent schools of thought on these issues, generating research, and identifying recommendations.

This discussion paper series presents technical research results that encompass a wide range of subjects drawn from research on policy-relevant aspects of agriculture, poverty, nutrition, and the environment. The discussion papers contain material that IFPRI believes is of key interest to those involved in addressing emerging Third World food and development problems. These discussion papers undergo review but typically do not present final research results and should be considered as works in progress.

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**Challenges to the 2020 Vision
for Latin America: Food and
Agriculture Since 1970**

James L. Garrett

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Washington, D.C. 20036-3006 U.S.A.
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Foreword

Part of developing a vision for the future is understanding where we have been before. As part of IFPRI's 2020 Vision initiative, regional workshops in Latin America, South Asia, and Sub-Saharan Africa brought together researchers, analysts, policymakers, and technical experts to develop regional strategies for eradicating hunger and malnutrition by 2020 while protecting the environment. Discussion Paper 6 presented the Latin American 2020 Vision and action plan. An earlier version of this paper, developed for the Latin American workshop, provided a window on the past to inform those discussions of the future.

This paper highlights the accomplishments and difficulties experienced by the region since 1970 on issues of food, agriculture, and the environment. It also points out areas that will demand special attention if the region is to attain the 2020 Vision. Chief among these are efforts to deal successfully with the processes of political and economic transformation occurring in the region, especially the need to boost the competitiveness of the food and agricultural system in an environmentally sustainable fashion and to improve the lot of smallholders and the rural poor.

Latin America possesses tremendous human and natural resources that can form the basis for achieving the 2020 Vision. Accomplishing the task will require a dedicated, concerted effort by all sectors of society, but it can be accomplished. Learning from the past, identifying critical constraints, and adapting current efforts to specific national and local conditions will be key. This paper is a contribution to those efforts.

Per Pinstrup-Andersen
Director General, IFPRI

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1. Introduction

Consolidation of the economic and political changes that have swept Latin America and the Caribbean in the past 25 years could now provide its citizens with a historic opportunity to shape a world where there is no hunger, extreme poverty, or malnutrition; where wealth is more evenly and fairly distributed; and where everyone works together to use and protect the region's natural resources for themselves and for future generations.¹

This vision of Latin America could be achieved by the year 2020, but to do so requires a sober assessment of the magnitude of the task facing those who would work toward it. Latin America still has unconscionable levels of poverty, food insecurity, and malnutrition. The health of the agricultural sector is critical to the well-being of the region's poorest people and that of the overall economy, especially through its contribution to export earnings. Over the next 25 years the sector must also feed growing numbers of people in the cities and face increased competition from abroad. The sector must meet these challenges even as much of the region's natural resources, which form the basis for agricultural production, are becoming degraded, primarily as a result of poverty and unwise macroeconomic and sectoral policies. Further losses will have devastating effects on the region's long-run prosperity.

The challenges of meeting future food needs, alleviating poverty, and sustainably managing the natural resource base are heightened by the dramatic changes in economic development strategy in Latin America in the past decade. National governments no longer look to the state as the motor of growth. Instead, they look to the market. Some-

times dramatically, sometimes only tentatively, the governments of the region are taking steps to liberalize, privatize, decentralize, and deconcentrate.

These changes, even when welcome and necessary, have roiled the economic and political landscape. The economic changes wrought by structural adjustment have been significant and probably permanent. The political changes may be ephemeral, but a process of decentralization is under way and, for now, almost every country in the region has a democratic government. Many civil conflicts have been resolved, although political violence continues in some, including Colombia, Mexico, and Peru, indicating a continuing need for improvement in social conditions.

The broad outlines of the new economic and political strategies are fairly distinct, but not the details. For example, there is no clear consensus on how to ensure that millions of small farmers are ready to face international competition or how to transfer responsibilities for education and health from a central government to thousands of municipalities. All this makes successful implementation of economic and political strategies difficult.

Latin America's success in achieving this vision by 2020 will depend on the region's ability to exploit its competitive advantages, especially its abundant natural resources. The vision thus demands an acknowledgment of the crucial role of agriculture and the development of an environmentally friendly, efficient, low-cost food and agricultural system.

A regional synthesis of the changes in food, agriculture, and the environment that have taken place in the past 25 years in the region is a first step in

¹See International Food Policy Research Institute (1995) and Garrett (1995) for a full description of this vision, developed in collaboration with Latin American and other regional experts as part of IFPRI's 2020 Vision initiative on food, agriculture, and the environment.

assessing the tasks needed to achieve the 2020 Vision. This analysis will highlight accomplishments and difficulties experienced by the region in the past 25 years and suggest what the major issues and questions may be in the next quarter century.

After a brief overview of changes in poverty and inequality during the past 25 years, the paper considers issues surrounding food security and malnutrition in the region, including the effects of increasing urbanization. A vibrant food and agricultural system is an important component of a strategy for broad-based growth and poverty reduction in Latin America. The paper notes how agricultural production and the use of technologies have

changed in past decades, and it surveys recent trade reforms that will undoubtedly affect the sector in the future.

This paper emphasizes that future agricultural growth depends on the proper protection of and sustainable use of the region's natural resources and examines the alarming current rates of environmental degradation. Finally, the paper looks at the significant political reforms that are occurring in the region. The reduction in the role of the central government could have serious negative consequences for future economic and social development if the transition to a more decentralized political structure is not handled with care.

2. Growth, Poverty, and Inequality in Latin America

The 1980s are often referred to as Latin America's "lost decade." Adjusted for inflation, per capita gross domestic product (GDP) at the end of the decade was 10 percent lower than at the beginning (World Bank 1995c). This lost decade represented a failure of the inward-looking, state-centered development strategy begun years earlier. Although it is hard to say how different Latin America would be now if it had pursued a more market-oriented strategy, it is also hard to argue that the strategy was a complete failure.

Under this state-centered strategy, Latin America enjoyed one of the highest economic growth rates in the world. Only five economies (Germany, Japan, the Republic of Korea, Taiwan, and Thailand) bettered Latin America's average growth rate between 1950 and 1973 (Maddison 1989 cited in Iglesias 1993). Per capita incomes rose by 33 percent over 1950 levels in the 1960s and another 40 percent in the 1970s. On average, between 1950 and 1980 per capita GNP in Latin America rose 2.7 percent a year. Cities grew, a middle class emerged, and social conditions improved. The infant mortality rate was halved, from 123 per 1,000 live births to 63, and average life expectancy increased by 13 years (Cornia 1994).

Even for those who believe that the policy of import substitution was a blunder from the very start, the model clearly produced significant social and economic advances. Ramos (1993) and other neostructuralists argue that, in fact, import substitution made a great deal of sense during the 1930s and 1940s, when the Great Depression and World War II made it almost impossible for Latin American countries to export and the government had to find a way to stimulate the private sector. And, they argue, it continued to make sense until at least the late 1950s when the aftermath of the war made it difficult to import significant amounts of manufactured

goods. Almost all analysts agree, however, that in the 1960s, the strategy began to yield diminishing returns, and by the 1970s, it was exhibiting signs of stress and fatigue.

By then, the areas in which imports could be substituted efficiently had been tapped. The region lost considerable ground in its ability to compete internationally, as trade barriers, including overvalued exchange rates, protected inefficient industries that otherwise would have been unable to compete on the world market. These barriers also had an adverse effect on exports. Countries piled up external debt to finance domestic consumption and investment. The contradictions of the strategy fed into one another, and in the face of rising interest rates in the late 1970s and early 1980s, the state-centered strategy collapsed (Iglesias 1993). Latin American governments were forced to adopt a new strategy where markets, not states, were the engines of growth.

The adjustments of the 1980s occurred primarily in two stages. First came stabilization, an attempt to deal with macroeconomic crisis and instability, usually through substantial devaluations and cuts in government expenditures. The second stage saw structural reform, usually involving a change in the development paradigm, including liberalization of markets, reduction of trade barriers, and privatization of government activities (Morley 1995).

Although some drastic changes in economic policies were necessary, and although the long-run effects of adjustment on economic growth and human development are expected to be positive, it borders on irresponsibility to argue that all the effects of adjustment have been positive for everyone. By their very nature, almost all stabilization programs reduce aggregate demand, leading to at least a short-run reduction in societal welfare.

Buffeted by economic shocks, war, and terrorism, per capita incomes leveled off during the

1980s. Per capita GDP for Latin America at the end of the decade in 1990 averaged US\$1,785 in constant 1987 dollars, some \$178 and 10 percent lower than in 1980 (World Bank 1995c). Figure 1 shows how different subregions fared.²

Because the experiences of countries within a group may have varied greatly, the figures apply to the group and not to individual countries.

In the 1990s, per capita GDP has stabilized or increased slightly in most countries of Latin America and the Caribbean. Still, the experiences with economic growth have been varied. Although the overall growth rate for the region from 1991 to 1996 was 3.1 percent, countries such as Brazil and Venezuela have vacillated between periods of growth and recession. In 1995 both Argentina and Mexico suffered

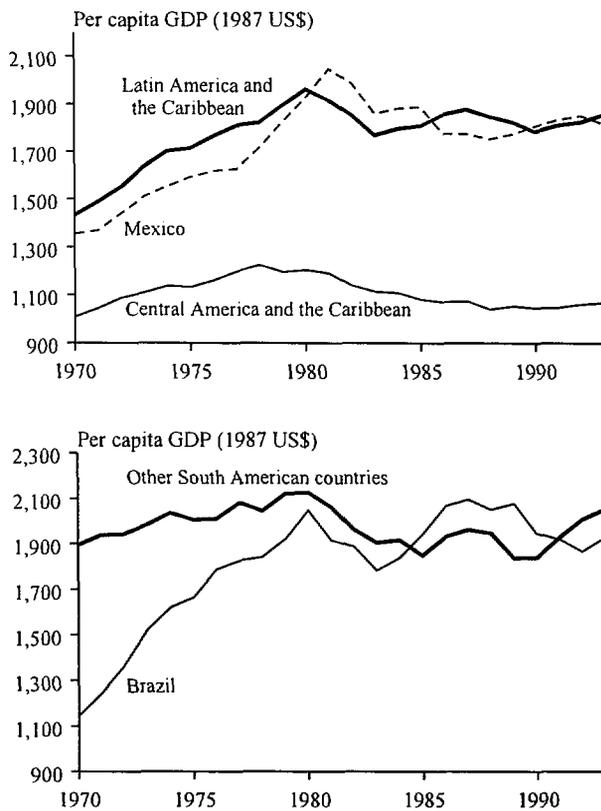
serious economic setbacks. In 1996, a pattern of modest growth accompanied by price stability re-emerged throughout the region, although it is not clear that this is part of a sustainable trend (ECLAC 1996).

Reduction in Poverty Slows

Despite rises in average incomes, over the last 25 years Latin America has made little progress in reducing poverty. In 1990, 46 percent of the people in the region were poor, the same percentage as in 1970 (Figure 2). And there were actually 76 million more poor people in 1990 than in 1970. Thirty million more people were absolutely poor. In some countries the percentage of poor has also increased. In 1970, 65 percent of Honduran households were poor; in 1990, 75 percent. In Chile, 17 percent of households were poor in 1970, compared with 28 percent in 1992.

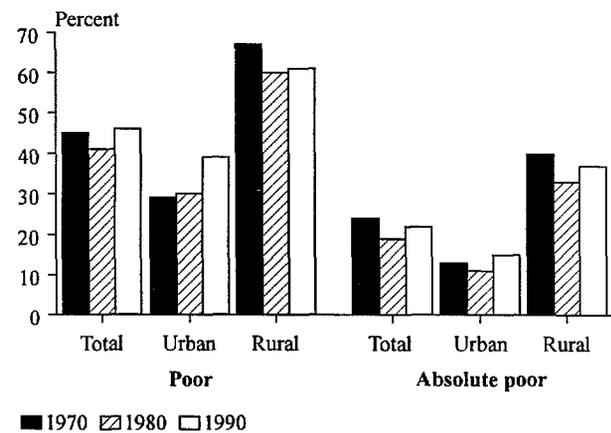
From 1970 to 1980 some progress was made in reducing rural poverty. In Latin America as a whole,

Figure 1—Per capita GDP, 1970–93



Source: World Bank 1995c.

Figure 2—Percentage of population living in poverty in Latin America, 1970, 1980, and 1990



Source: CEPAL 1994.

Notes: A "poor" individual is one whose income is inadequate to meet minimum daily nutritional requirements as well as other basic needs, such as sufficient hygiene, clothing, education, and transportation. The "absolute poor" are those individuals whose income is inadequate to satisfy minimum daily nutritional requirements, even if other basic needs are forgone.

²Latin America and the Caribbean refers to Mexico, Central America, South America, and the Caribbean combined. For ease of exposition, Central America and the Caribbean are combined, as are all South American countries except Brazil. Because the figures are weighted by population, Mexico and Brazil, as large countries, are treated separately.

the share of rural people who were poor fell from 67 to 60 percent in that period, reducing the number of poor in rural areas by about 2.6 million people (Table 1). Between 1980 and 1990, however, both urban and rural poverty increased, with rural poverty growing by 10 percent and urban poverty by 84 percent.

With increasing urbanization, more of the poor now live in urban than in rural areas. The percentage of urban dwellers who are poor increased from 29 percent in 1970 to 39 percent in 1990, while the percentage of rural dwellers who are poor declined from 67 percent to 61 percent. But from 1970 to 1990 the number of urban poor increased by 71 million people, while the number of poor people in rural areas increased by only about 5 million (Table 1). By 1990, 115.5 million poor people lived in cities, while 80.4 million lived in rural areas.

This increase in urban poverty is not entirely surprising given that the adjustment programs of the 1980s reversed some of the bias of government policies against agriculture and that some measures, such as the removal of consumer subsidies, probably hit urban households harder than rural households. Rural households are still more likely to be poor than urban households, and rural poverty is likely to be more severe than urban poverty. The percentage of urban poor who are absolutely poor

decreased from 45 to 39 percent from 1970 to 1990, while the percentage of rural poor in this category increased from 58 to 60 percent (Table 2).

With the continuation of conditions favorable to economic growth in countries like Bolivia, Colombia, Chile, and Peru, there is hope that the reduction in poverty will pick up again. Economic growth in many countries, however, still seems fragile, and an uneasy relationship between inflation and the growth needed to increase incomes and employment still exists. Job creation in the 1990s has been sluggish. Overall unemployment in 1996 is relatively high at about 7 percent, and the unemployment rate for the region's urban areas was expected to close out the year at its highest level so far this decade (ECLAC 1996). Lack of more rapid job growth makes it unlikely that poverty has declined significantly in the region in recent years.

Inequality Hinders Poverty Alleviation

The striking inequality in the distribution of income, land, and opportunity in Latin America has contributed to the lack of success in reducing poverty. Inequality hampers the growth necessary to pull millions out of poverty by hindering the accumulation of human and physical capital. A more egalitarian income distribution, for example, could increase school enrollment, improving the quality of human resources crucial to growth. Inequality also contributes to the political instability that manifests itself in peasant (*campesino*) uprisings in Mexico and street riots in Venezuela. This instability can frighten away investors and reduce the supply of capital necessary for future growth (Lustig 1995).

Although income distribution in Bolivia, Jamaica, Peru, and Venezuela compares favorably with that of the United States and Canada, the share of income going to the poorest 40 percent of households is only 7 percent in Brazil, 8 percent in Guatemala, and 9 percent in Honduras (Table 3). And inequality in land distribution is so great in some countries that it nears its theoretical maximum (complete inequality would produce a Gini index of 1) (Table 4).

Traditional policies have reinforced, if not actually caused, such high levels of inequality. Macroeconomic and sectoral policies historically

Table 1—Magnitude of poverty in Latin America, 1970, 1980, and 1990

| Year | Poor | | | Absolute poor | | |
|------|-------------|---------|--------|---------------|--------|--------|
| | Total | Urban | Rural | Total | Urban | Rural |
| | (thousands) | | | | | |
| 1970 | 119,800 | 44,200 | 75,600 | 63,700 | 19,900 | 43,800 |
| 1980 | 135,900 | 62,900 | 73,000 | 62,400 | 22,500 | 39,900 |
| 1990 | 195,900 | 115,500 | 80,400 | 93,500 | 44,900 | 48,600 |

Source: CEPAL 1994.

Table 2—Absolute poor as a share of total poor in Latin America, 1970, 1980, and 1990

| Year | Total | Urban | | Rural |
|------|-------|-----------|--|-------|
| | | (percent) | | |
| 1970 | 53 | 45 | | 58 |
| 1980 | 46 | 36 | | 55 |
| 1990 | 48 | 39 | | 60 |

Source: CEPAL 1994.

avored capital-intensive production, despite the region's abundance of land and low educational levels, which should have made labor relatively less expensive. In large countries like Argentina, Brazil, and Mexico, growth was led by modern, high-wage sectors (Morley 1995). Policies favored owners of capital over the poor, whose primary resource was labor, and contributed to growing inequalities in income and resource distribution. Lack of education, health services, and infrastructure in rural areas reinforced poverty and inequality there (Cornia 1994).

Some researchers have asserted that increased income inequality is a prerequisite for or a necessary consequence of economic growth, but a recent

study asserts that inequality has a negative effect on growth (Birdsall and Sabot 1994). In Brazil, for example, researchers calculated that the income captured by the richest 20 percent of the population is 32 times the income received by the poorest 20 percent. In the Republic of Korea, the richest 20 percent receives only 8 times that of the poorest 20 percent. The researchers calculated that if, in 1960, Brazil's ratio had been like Korea's, by 1975, Brazil's GDP per capita would have been 17.2 percent higher than it was (Birdsall and Sabot 1994). Investment in human capital, particularly education and health, is critical to ensuring that all citizens can participate in the market and share in the growth the new economic strategy will generate.

Table 3—Distribution of income share, selected countries, 1981–93

| Country | Percent of income to lowest 40 percent of households | Ratio of highest 20 percent to lowest 20 percent |
|--------------------|--|--|
| Bolivia | 15 | 9 |
| Brazil | 7 | 32 |
| Canada | 18 | 7 |
| Chile | 10 | 18 |
| Colombia | 11 | 16 |
| Costa Rica | 13 | 13 |
| Dominican Republic | 12 | 13 |
| Guatemala | 8 | 30 |
| Honduras | 9 | 24 |
| Jamaica | 16 | 8 |
| Mexico | 12 | 14 |
| Panama | 8 | 30 |
| Peru | 14 | 11 |
| United States | 16 | 9 |
| Venezuela | 14 | 10 |

Source: UNDP 1996.

Table 4—Land concentration and rural poverty, selected countries, 1981–84

| Country | Percent of rural population in poverty | Hectares/farm worker | Gini index of land concentration | Percent of landless in total rural families |
|--------------------|--|----------------------|----------------------------------|---|
| Korea, Republic of | 10 | 0.4 | 0.301 | 4 |
| Egypt | 18 | 0.5 | 0.430 | 24 |
| Panama | 30 | 2.8 | 0.840 | 20 |
| Thailand | 34 | 0.8 | 0.460 | 10 |
| Pakistan | 39 | 1.4 | 0.539 | 31 |
| Philippines | 42 | 1.2 | 0.530 | 37 |
| Indonesia | 44 | 0.7 | 0.620 | 36 |
| Jamaica | 51 | 0.8 | 0.815 | 41 |
| Venezuela | 56 | 5.1 | 0.920 | 27 |
| Honduras | 58 | 1.4 | 0.780 | 33 |
| Paraguay | 63 | 11.4 | 0.939 | 27 |
| Brazil | 67 | 6.0 | 0.859 | 39 |

Source: Cornia 1994.

3. Food Insecurity and Malnutrition

Over the past 25 years, then, the region has undergone major economic shocks, poverty has not declined, and inequality in the distribution of wealth has continued. How have these conditions affected food security and nutrition?

Calorie Availability

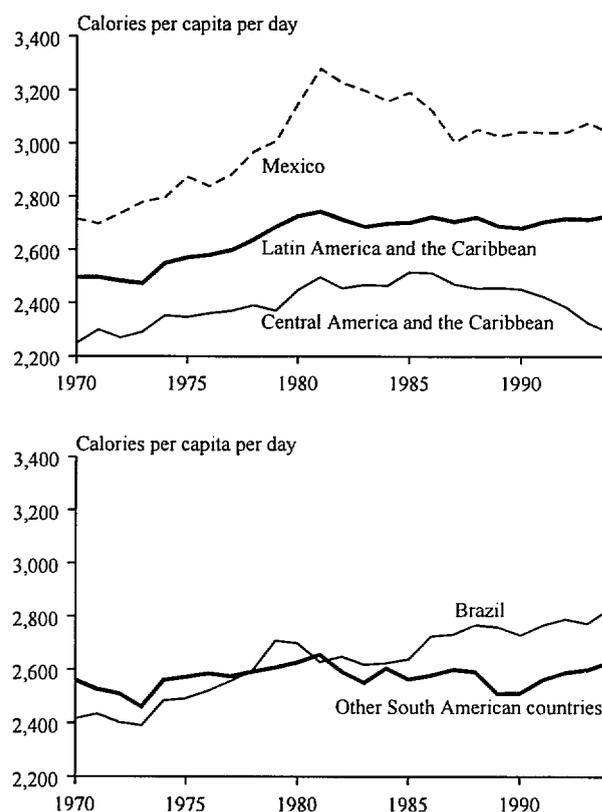
Daily calories available per capita have been relatively stable in recent years, at about 2,700. In line with the decline in per capita incomes during the 1980s, calorie availability in the region also declined slightly, after increasing 9 percent during the 1970s. In Central America and the Caribbean, calorie availability per capita rose to 2,500 calories by the mid-1980s but has declined to about 2,300 calories now. In South America, calorie availability has fluctuated between about 2,500 and 2,650 calories in the past 25 years, although an upward trend is apparent in recent years. Brazil has seen consistent increases in calorie availability over the period, and calorie availability per capita was 10 percent higher in 1994 than in 1970 (Figure 3).

Although, on average, individuals in most Latin American countries appear to be at or above nutritional requirements (approximately 2,000 to 2,200 calories per day), 58 million people in the region remain underfed as a result of extensive poverty and unequal distribution of services. This is approximately 15 percent of the population in Mexico, Central America, and the Caribbean and 13 percent of the population in South America (ACC/SCN 1992).

Malnutrition

Malnutrition in Latin America declined substantially in the 1970s, but with the economic and political disruptions of the 1980s, the decreases in malnutrition rates were arrested. In Central America, Mexico, and the Caribbean, the percentage of

Figure 3—Calorie supply per capita per day, 1970–94

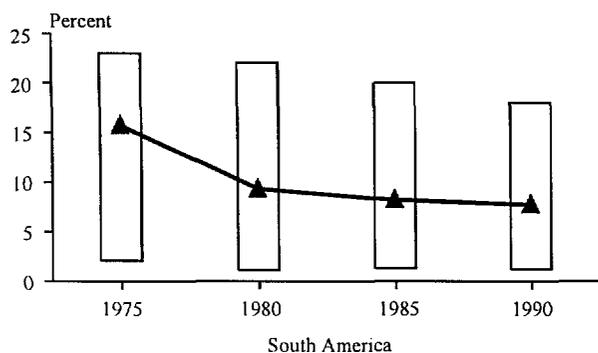
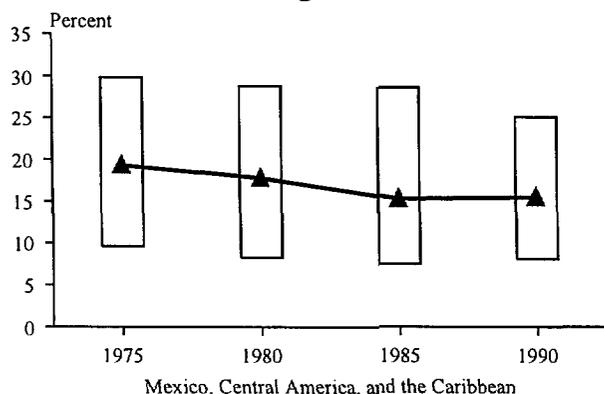


Source: FAO 1996.

children who were malnourished (below -2 standard deviations of their predicted weight-for-age) dropped from 19 percent in 1975 to 15 percent in 1985 (Figure 4). In South America, the percentage of children who were malnourished declined from 16 percent in 1975 to 9 percent in 1980, an astonishing fall in only five years (ACC/SCN 1992).

Despite improved economic performance in many Latin American countries in the latter half of the 1980s, malnutrition levels have not yet resumed their general decline. The decline in the level of

Figure 4—Percentages of children predicted to be underweight, 1975–90



Source: ACC/SCN 1993.

Note: Bars show range of predictions for countries in the subregions. Percentages are shares of children predicted to fall below -2 standard deviations of weight-for-age.

malnutrition in South America has slowed, and malnutrition in Central America, Mexico, and the Caribbean actually increased slightly from 1985 to 1990. Six million children in Latin America are malnourished today: 3 million in Mexico, Central America, and the Caribbean, and 3 million in South America (ACC/SCN 1992). In Guatemala and Haiti, one out of every four children is malnourished; in Bolivia and Peru, it is one out of every seven.

The economic crises and restructuring programs of the 1980s often led to sharp drops in economic activity and sharp increases in unemployment, but nutrition in the region as a whole proved remarkably resilient. The underlying levels of literacy, health infrastructure, and social services, which are generally high by developing-country standards, and a fall in fertility rates, may have helped to keep mal-

nutrition from increasing in the face of economic and political crises (ACC/SCN 1992).

It should also be noted that, although the prevalence of underweight children in South America is the lowest in the developing world—around 8 percent—malnutrition continues to be a serious problem in some countries of the subregion. In Peru and Ecuador, about 13 percent of children are underweight, but in Argentina and Chile, less than 2 percent of children are underweight. Even in a well-fed population, 2.5 percent of children are likely to fall 2 standard deviations below the mean; therefore, these countries, on average, are nearing the point where malnutrition is not a widespread problem (ACC/SCN 1992, 1993).

Health, Sanitation, and Care

For good nutrition, households must not only be able to afford enough food. They must also have good health habits, good caring behaviors, and access to good health care and safe water. The structural adjustment programs of the 1980s frequently required reductions in government expenditures, including health services. In Mexico, Central America, and the Caribbean, government expenditures on health fell during the crisis and adjustment periods, generally in line with falls in the total government budget. Most South American governments, however, successfully protected expenditures on health.

Better targeting of programs and adoption of more cost-effective practices may have offset some of the negative effects of budget cuts (ACC/SCN 1992). In fact, many governments took special steps to protect the food consumption and health of the poor, particularly children and pregnant women. In Mexico, as government officials sought to cut expenditures, general food subsidies were replaced with interventions more specifically targeted to low-income households. Maternal and child health and food programs were also in place in most Central American countries and usually covered more than half the school age population (ACC/SCN 1992).

The high percentage of the population with access to health services, safe water, and sanitation probably buffered them against the negative effects of structural adjustment, but the percentage without

access varies by region and also by whether the individual lives in an urban or rural area (Table 5). Although almost 75 percent of South Americans have access to health care, only about 60 percent of the households in Central America and the Caribbean do. Close to 80 percent or more of urban households in Latin America have a household tap or easy access to water, yet close to half the rural population does not. Similarly, provision of adequate sanitation in cities is 80 percent in Latin America as a whole, but drops to 31 percent in rural areas.

Care within the household can also affect malnutrition in children, but easily available, comparable indicators for adequacy of child care are difficult to come by. Educational levels of women, however, have been shown to have a positive association with improved child care. Literacy among women is more than 90 percent in Costa Rica and Mexico and

about 75 percent in the Dominican Republic, El Salvador, and Guatemala. The average female enrollment in secondary school in this region was 49 percent in 1990, up from 34 percent in 1975. There are virtually no differences between male and female literacy rates in most of these countries.

Female literacy in South America is also high, and educational levels continue to increase. For example, in Chile, secondary school enrollment of females rose from 55 percent in 1980 to 74 percent in 1990. There is a slight difference in literacy between males and females but not as high as in most other developing regions in the world (ACC/SCN 1992).

In sum, nutritional status improved markedly in the 1970s but stagnated in the 1980s. The relatively widespread access to food, to health care, and to education means that it is likely that malnutrition will continue to decline, but this prospect is conditional on restarting and sustaining economic growth, particularly among the poorest countries, and on distributing the benefits of growth among the poorest households (ACC/SCN 1992).

The positive impact of increases in income on malnutrition declines as income levels rise, however. Countries such as Costa Rica that have better-than-expected health indicators given their level of income tend to make significant expenditures on health, education, and social welfare (ACC/SCN 1992). The Pan-American Health Organization attributes the reduction in malnutrition achieved in some countries to the pursuit of strategies that improve health and caring behaviors, such as increased breast-feeding, improved child feeding during illness, improved nutritional education, and programs of immunization and control of diarrhea and respiratory ailments, rather than to increases in incomes per se (OPS 1994). As incomes in the region increase, the household's ability to access food should increase as well, and governments and non-governmental organizations will have to pay increased attention to these health- and care-related factors that affect nutrition.

In an era of government budget cuts, in addition to policies aimed at generating labor-based growth, further reduction of the levels of malnutrition may also require more effective targeting of existing

Table 5—Percentage of population with access to health services, water, and sanitation

| Service/region | Urban | Rural | Total |
|---|-------|-------|-------|
| Health services, 1990 | | | |
| Latin America and the Caribbean | n.a. | n.a. | 72 |
| Mexico | n.a. | n.a. | 77 |
| Central America and the Caribbean ^{a, b} | n.a. | n.a. | 62 |
| Brazil | n.a. | n.a. | 72 |
| South America, except Brazil | n.a. | n.a. | 73 |
| Water, 1992 | | | |
| Latin America and the Caribbean | 89 | 54 | 79 |
| Mexico | 90 | 66 | 83 |
| Central America and the Caribbean ^{b, c} | 86 | 47 | 67 |
| Brazil | 99 | 68 | 92 |
| South America, except Brazil ^d | 79 | 40 | 68 |
| Sanitation, 1992 | | | |
| Latin America and the Caribbean | 80 | 31 | 66 |
| Mexico | 81 | 29 | 66 |
| Central America and the Caribbean ^{b, c} | 77 | 45 | 61 |
| Brazil | 83 | 35 | 73 |
| South America, except Brazil ^d | 76 | 28 | 60 |

Source: OPS 1994.

Note: n.a. is "not available."

^aExcludes Haiti.

^bExcludes Antigua and Barbuda, Costa Rica, Dominica, St. Kitts and Nevis, St. Lucia, and St. Vincent.

^cExcludes Nicaragua.

^dUrban figures exclude Paraguay; rural figures exclude Uruguay; total excludes Paraguay and Uruguay.

programs and special efforts to reach the poor in remote areas and to provide them with adequate access to health care, education, and social assistance (ACC/SCN 1992). The most pressing issue in the

future may be in devising appropriate institutional mechanisms to reach these populations and support the households' own strategies to achieve food and nutritional security.

4. The Effects of Urbanization

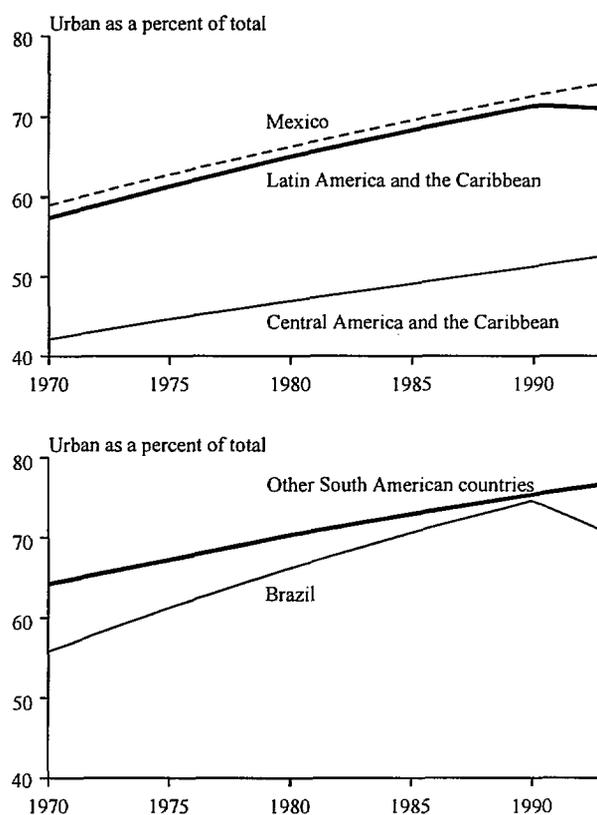
During the twentieth century, Latin America has experienced an intense period of urbanization. The growth of the cities was fueled by an economic strategy that emphasized urban-based industrialization and import-substitution and neglected or actively discriminated against agriculture and rural areas in the process. By the early 1990s, more than 70 percent of Latin Americans lived in cities, up from 57 percent in 1970 and about 40 percent in 1950.

The figure varies by country. On the low side, 53 percent of the population of Central America and the Caribbean is urban. Seventy-four percent of Mexicans, 77 percent of South Americans (outside Brazil), and 92 percent of Venezuelans live in urban areas. Urbanization in Brazil actually declined from 75 percent in 1990 to 71 percent in 1993 (Figure 5). Such high levels of urbanization indicate that most future growth of cities will not be due to migration from rural areas but from natural growth of the urban population.

Increased urbanization has implications for food security and nutritional status that have yet to be fully explored. Urban dwellers generally purchase, prepare, and consume food differently from rural dwellers. Those who live in the city often work and eat outside the home. In Latin America, advertising and the introduction of fast-food restaurants are encouraging a transition to a diet with increased amounts of fats, sugar, and cholesterol (Pomareda 1995). In general, as processed foods replace traditional foods, including native cereals or tubers, the intake of complex carbohydrates decreases.

Vitamin A consumption, however, increases as more dairy products and green leafy vegetables are consumed. Stability of the food supply is improved as more efficient markets smooth out the surpluses and scarcities associated with the seasonality of the agricultural cycle (Ruel et al. 1997). Although the importance of urban agriculture in the region has not been

Figure 5—Urbanization in Latin America and the Caribbean, 1970–93



Source: World Bank 1995c.

examined in detail, many city dwellers probably do not have the option of using their own crops or livestock to cushion income shocks. Urban dwellers probably also rely more on neighborhood agencies such as soup kitchens and access to government programs rather than extended families to deal with setbacks caused by job loss or underemployment. Also, although urban households tend to have greater access to health services and sanitation, urban crowding may hasten the spread of disease (Ruel et al. 1997).

Women in urban areas work away from home more frequently than in rural areas. When women are seen as responsible for bringing income into the household, their control over resources may increase. The increase in total income and the amount of control women have over it may lead to increased expenditures on food and children's needs. At the same time, women who work outside the home may spend less time on child care, and in urban areas the length of time a woman breast-feeds declines. It seems likely that these events exert conflicting influences on child nutrition, but their combined effects are as yet unclear (Quisumbing et al. 1995; Ruel et al. 1997).

These differences mean that the primary determinants of food insecurity and malnutrition in ur-

ban areas may differ from those in rural areas, suggesting that the ways to improve food security and nutrition may differ from those used in rural areas. Indeed, these effects are already present in the form of an epidemiological transition. A health profile of the urban poor in Latin America shows that they tend to have both the nutritional deficiencies typical of poor societies and the chronic, nontransmissible diseases typical of industrialized societies, such as atherosclerosis. For the urban poor, the issue is not only a matter of ensuring that they get enough food to eat; they must also be sure it is of sufficiently high quality to avoid additional health problems (Sánchez-Griñán 1995).

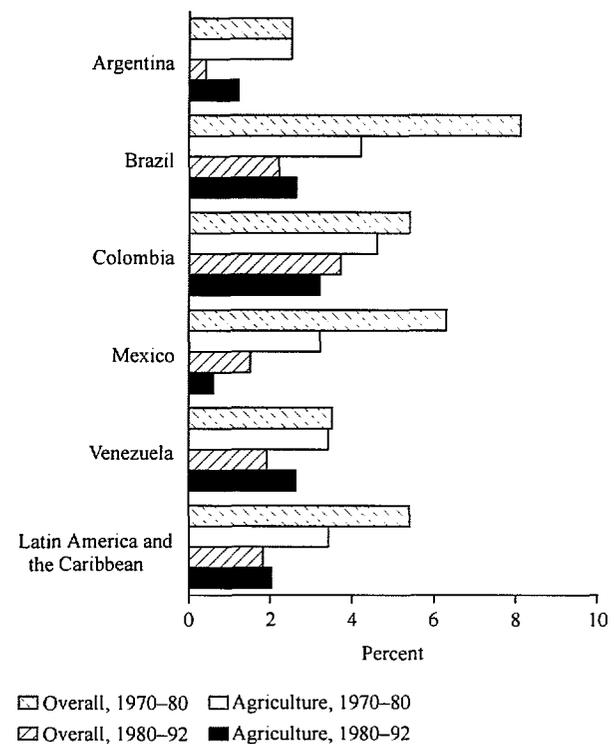
5. The Food and Agriculture System: A Key Element of Sustainable Growth

Latin America's success in reducing poverty, eliminating malnutrition, and meeting the food needs of a growing and increasingly urban population depends on its ability to generate broad-based growth in the new market-based economic environment. The abundance and diversity of Latin America's agriculture and its natural resources provide the region with an enormous comparative advantage with which to compete on world markets. Sustainable development of agriculture and natural resources can contribute substantially to overall economic and social development, especially in rural areas, where poverty is generally most severe.

The emphasis on the importance of agriculture to overall growth may at first seem surprising, given the growth of urban areas and industry in recent decades. But although the relative contribution of agricultural production to the economy has declined significantly over time, the absolute contribution of the overall food and agricultural system to the economy has not. Indeed, although agriculture lagged behind other sectors of the economy in the 1970s, in most countries today, agriculture is a vibrant sector that actually grew faster than the overall economy during 1980-92 (Figure 6).

Agricultural production alone is now worth more than US\$90 billion to the region and contributes more than 10 percent to GDP (IDB 1994). In the poorest countries, such as Bolivia, Guatemala, Honduras, and Paraguay, 50 percent or more of the population still lives in rural areas. For them, the vitality of agriculture directly affects their well-being. Agriculture also has significant multiplier effects that are beneficial to all of society, rural or urban. A healthy agricultural sector generates employment in transportation, retailing, and processing as production and rural incomes rise, which in turn cre-

Figure 6—Average annual growth rate of GDP and agricultural GDP, 1970-80 and 1980-92



Source: World Bank 1994.

ates demand for additional nonagricultural goods and services. It has been estimated that every increase of US\$1 in agricultural output in Latin America increases overall economic output by almost US\$4 (Pinstrip-Andersen, Lundberg, and Garrett 1995).

Furthermore, as a whole, the food and agricultural system, including agroindustry, accounts for more than 20 percent of all economic activity in many countries, and it easily reaches 10 percent

even in highly urbanized countries like Argentina and Mexico (Figure 7). Agroindustry in Latin America has a good deal of room to grow and will likely serve as a leading subsector of the system. In most of Latin America, agroindustry, more than 80 percent of which is food related, accounts for less than 30 percent of the total value of the food and agricultural system, compared with between 80 and 90 percent in developed countries (Schejtman 1994).

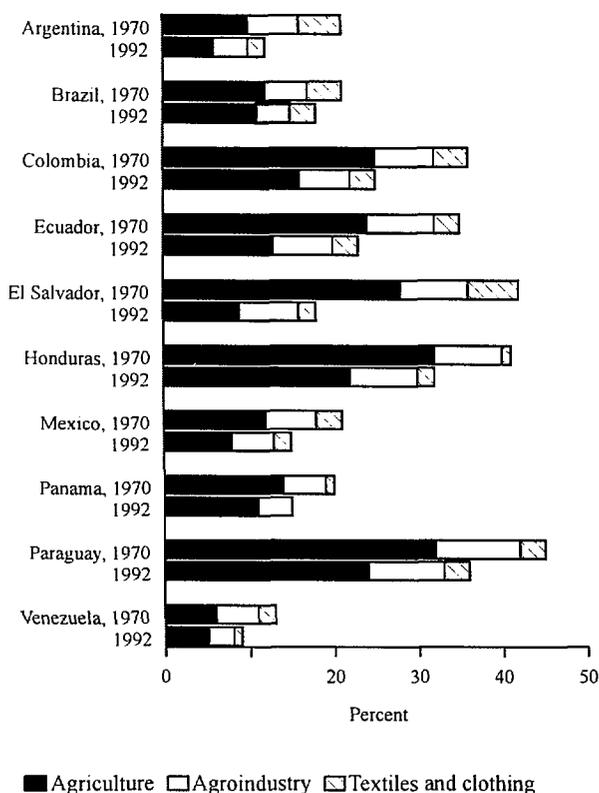
For now, Latin American agribusinesses and agroindustries tend to be highly concentrated. In Mexico, more than 50 percent of production comes from only 8 percent of agribusinesses, while less than 5 percent of production comes from 63 percent of agribusinesses. In Ecuador, the 29 largest agroindustries generate more than half the production. Along with the growth of agribusinesses in nontraditional exports, such as fruit and wine from Chile,

vegetables from Mexico, and flowers from Colombia, processed foods for the domestic market are also becoming more important.

Supermarkets and fast-food restaurants are also proliferating. Supermarkets first appeared in Brazil in the 1950s, but by the early 1970s, they provided only 20 percent of food sales. By the end of the 1980s, however, supermarkets had captured 80 percent of food sales and employed 500,000 people. In Chile, supermarkets supply 65 percent of food for middle-income households and 45 percent for low-income households (IICA 1995; Schejtman 1994).

The principal challenges to Latin American agriculture in the next 25 years will arise from the need to make the sector, including smallholders, more competitive, while protecting the natural resource base. Government and the private sector must work together to add value to agricultural production through development of agribusiness and agroindustry. Increased productivity and development of the food and agricultural system beyond agricultural production will require intensification and wise use of inputs such as fertilizer and water; increased use of knowledge-intensive and environmentally friendly technologies, including better management techniques; improved productive infrastructure, such as roads and financial services; continued investment in agricultural research; and stable and transparent macroeconomic policies (Garrett 1995).

Figure 7—Agriculture and agroindustry as a share of GDP, 1970 and 1992



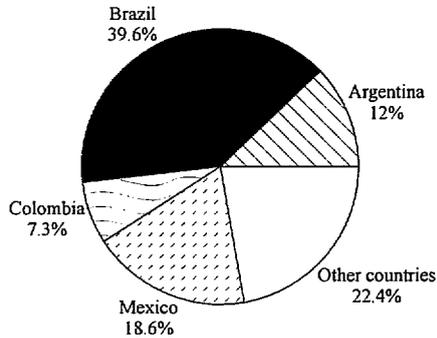
Source: World Bank 1995a; World Bank 1995b.

Patterns of Agricultural Production

Four countries dominate the agricultural output of the region. Brazil contributes 40 percent of the total value of agricultural output (Figure 8). Mexico accounts for 19 percent of the total, while Argentina and Colombia contribute 12 percent and 7 percent, respectively. Together, these four countries make up more than three-quarters of the value of Latin American agricultural production.

The general composition of food crops grown in Latin America has stayed fairly stable over time (Table 6). Since the early 1970s, for example, the area devoted to cereal production in Mexico, Central America, and the Caribbean has hovered around 70 percent, while it dropped from 75 percent to 70 percent in South America.

Figure 8—Shares of selected countries in Latin American agriculture, 1994



Source: IDB 1995.

Although the composition has remained the same, the area devoted to food production has increased by about 6 percent and the volume of production has increased by 66 percent, primarily owing to increasing yields. Cereal production increased from an average of 74 million tons in 1972–74 to 118 million tons in 1992–94 (FAO 1995).³

In terms of volume, in 1992–94, South America produced about 70 percent of all cereals, while Mexico, Central America, and the Caribbean accounted for the rest.

By far the most important cereal in Latin America was maize, with 58 percent of total cereal production (Figure 9). Rice and wheat each accounted for about 16 percent of production in the region. These figures

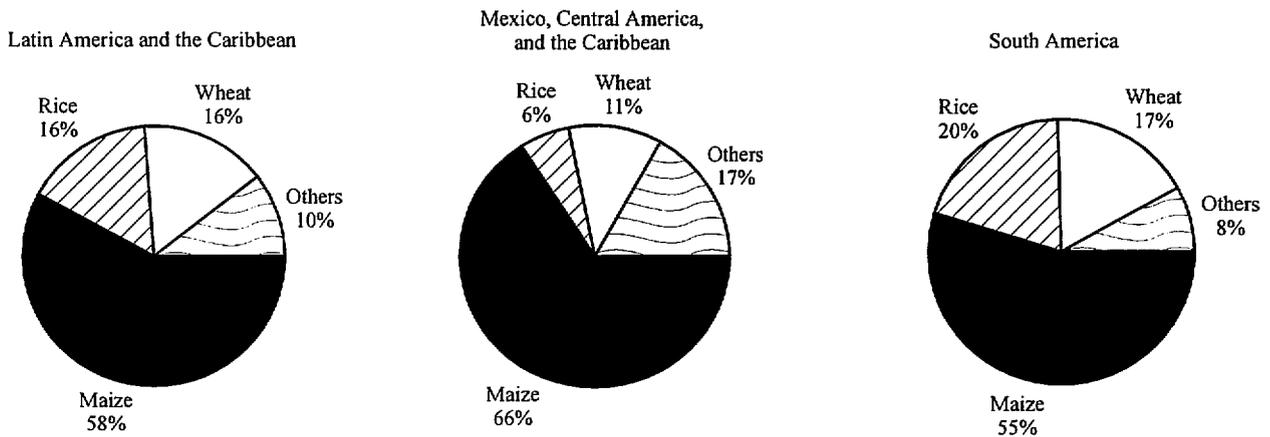
are somewhat skewed by the much larger proportion of rice produced in South America. In Mexico, Central America, and the Caribbean, maize represented 66 percent of cereal production and rice about 6 percent.

Figure 10, given in a logarithmic scale to show percentage changes, indicates that from 1970 to 1994, the land area planted in cereals has been stable. Yields increased by 67 percent, however, from 1.5 tons per hectare to 2.5 tons per hectare, about 3.7 percent per year during the period.

Some analysts have argued that the economic adjustment programs of the 1980s, especially the opening of borders to trade, will cause these crop patterns to change as producers plant to take advantage of hypothesized comparative advantage. Figures in Table 6, which show average production during 1972–74 and 1992–94, do not yet provide evidence for such a shift. This may be because agriculture is often given special treatment in trade accords, because the categories hide important shifts of production within categories, or because, in some cases, domestic agricultural policies subvert the expected effect of trade liberalization.

Crop patterns may also be slow to shift because they reflect not only prices, but also the agroecology of the zone and the characteristics of the predominant producers there. Highly mechanized medium- and large-sized farms predominate in

Figure 9—Average distribution of volume of cereal production among crops, 1992–94



Source: FAO 1995.

³In this paper, all tons are metric tons.

Table 6—Area harvested and volume of food production in Latin America and the Caribbean (shares and totals, three-year average), 1972–94

| Crop/region | 1972–74 | 1982–84 | 1992–94 |
|---|---------|---------|---------|
| Area harvested (1,000 hectares) | | | |
| Latin America and the Caribbean | 64,086 | 71,527 | 67,940 |
| Mexico, Central America, and the Caribbean | 17,711 | 18,239 | 18,959 |
| South America | 46,375 | 53,288 | 48,981 |
| Share of area in food production (percent) | | | |
| Latin America and the Caribbean | | | |
| Cereals | 73 | 72 | 70 |
| Roots and tubers | 7 | 6 | 6 |
| Sugar crops | 8 | 10 | 11 |
| Fruits | n.a. | n.a. | n.a. |
| Vegetables | n.a. | n.a. | n.a. |
| Others | 12 | 12 | 13 |
| Mexico, Central America, and the Caribbean | | | |
| Cereals | 70 | 69 | 70 |
| Roots and tubers | 3 | 3 | 3 |
| Sugar crops | 13 | 14 | 13 |
| Fruits | n.a. | n.a. | n.a. |
| Vegetables | n.a. | n.a. | n.a. |
| Others | 15 | 15 | 14 |
| South America | | | |
| Cereals | 75 | 73 | 70 |
| Roots and tubers | 8 | 7 | 7 |
| Sugar crops | 6 | 8 | 11 |
| Fruits | n.a. | n.a. | n.a. |
| Vegetables | n.a. | n.a. | n.a. |
| Others | 11 | 12 | 12 |
| Volume (1,000 metric tons) | | | |
| Latin America and the Caribbean | 455,738 | 662,983 | 757,615 |
| Mexico, Central America, and the Caribbean | 159,770 | 206,042 | 197,555 |
| South America | 295,968 | 456,941 | 560,060 |
| Share of volume of food production (percent) | | | |
| Latin America and the Caribbean | | | |
| Cereals | 16 | 16 | 16 |
| Roots and tubers | 10 | 7 | 6 |
| Sugar crops | 59 | 64 | 62 |
| Fruits | 10 | 9 | 11 |
| Vegetables | 3 | 3 | 3 |
| Others | 2 | 2 | 2 |
| Mexico, Central America, and the Caribbean | | | |
| Cereals | 12 | 13 | 17 |
| Roots and tubers | 2 | 2 | 2 |
| Sugar crops | 73 | 72 | 65 |
| Fruits | 9 | 9 | 11 |
| Vegetables | 3 | 3 | 4 |
| Others | 1 | 1 | 1 |
| South America | | | |
| Cereals | 19 | 17 | 15 |
| Roots and tubers | 15 | 9 | 7 |
| Sugar crops | 51 | 61 | 62 |
| Fruits | 10 | 9 | 11 |
| Vegetables | 3 | 3 | 3 |
| Others | 2 | 2 | 2 |

Source: FAO 1995.

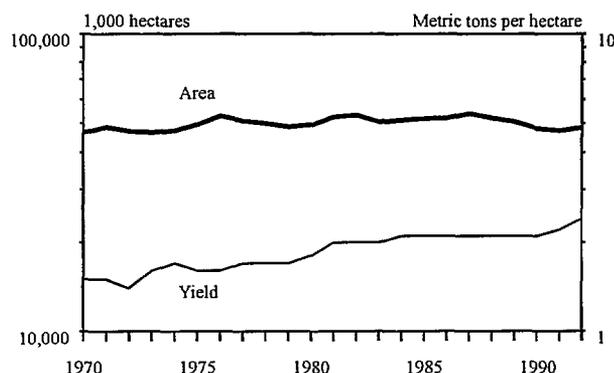
Note: Information on area harvested of fruits and vegetables was not available.

Argentina, Uruguay, and the southern part of Brazil. The use of agrochemicals such as fertilizers and fungicides is small but growing, relative to industrialized country agriculture. In these areas, the number of small farmers is decreasing; the rural

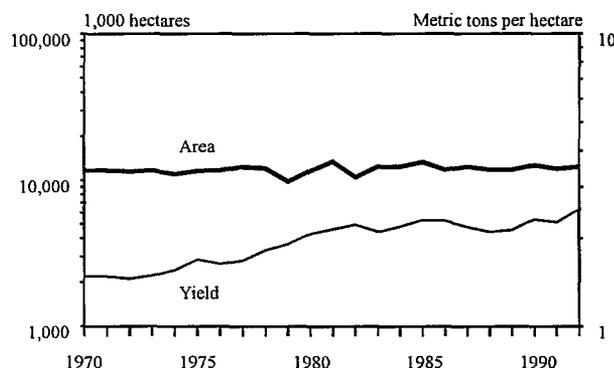
population is declining. Forested area is stable or even increasing. Monoculture systems are replacing more traditional systems of crop-livestock rotations, often with negative effects on soil quality (Kaimowitz 1995).

Figure 10—Log of area and yield of cereals, 1970–94

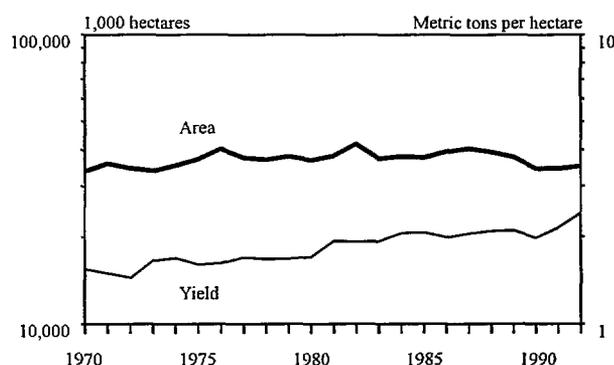
Latin America and the Caribbean



Mexico, Central America, and the Caribbean



South America



Source: FAO 1995.

In central and southern Mexico, the hillsides of Central America, the Andean region, Haiti, the Dominican Republic, and the northeast region of Brazil, smallholders predominate. Smallholders are usually, though not always, poor. They frequently diversify their agricultural production by planting a variety of crops and raising livestock as part of a strategy to reduce risk and variation in household income (Kaimowitz 1995).

In Chile and the tropics, crops with a high value per unit area, such as cotton, coffee, sugar, flowers, fruit, and vegetables, predominate. Producers in these areas tend to employ large amounts of agrochemicals and unsalaried, seasonal labor. In the past decade, production of nontraditional exports, such as fruit in Brazil, flowers in Colombia and Costa Rica, fruit and forest products in Chile, and vegetables in Mexico, has increased rapidly. Because of the use of substantial amounts of agrochemicals over time, these growers now face the greatest environmental challenges. Plant diseases are increasingly resistant to fungicides, and the chemicals have often contaminated irrigation water and poisoned agricultural workers (Kaimowitz 1995).

The Role of Smallholders

Certainly producers across Latin America are highly diverse, and production techniques and patterns vary even within countries. Still, a bimodal pattern of production seems to hold in Latin America: some producers use highly land- and input-intensive techniques on relatively large landholdings, while other producers are scarcely mechanized and use relatively few inputs on small plots of land (Kaimowitz 1995).

Toward the end of the 1980s, there were approximately 17 million rural landholdings, with a total of about 700 million hectares. Of these, 15.7 million could be defined as “family units” of less than 3 hectares. Of these, 11.7 million were farmed

by *minifundistas* and 4 million by smallholders. Thus, *minifundistas* represented almost 70 percent of landholders and smallholders about 24 percent, but together they held no more than 7 percent of the land (Chiriboga 1994).⁴

Differing perceptions surround the issue of the importance of smallholders and *minifundistas* to production. Some argue that small farmers are no longer important to the future of agriculture and that large, commercial farmers will soon crowd them out. Others argue that not only do small farmers provide a substantial amount of agricultural goods, but their large numbers mean that their welfare is a social, not just an economic, question.

Smallholders are in fact more important than their share of arable and permanent crop land would suggest. In addition to earning foreign exchange through their production for the export market, they also produce a large proportion of the basic foods important to national diets, such as corn, beans, and potatoes. For the countries for which data are available, smallholders commonly produce up to a third of the production of basic cereals, even though their share of cropland rarely exceeds 15 percent (Table 7). Only in Chile

do smallholders generally have a share of production lower than their share of cropland. These figures hardly support the notion that they are irrelevant to agricultural production.

If they are provided equivalent access to public goods and appropriate, cost-effective technologies, smallholders should be able to hold their own with large producers and international competition under trade liberalization. The key is to provide them with public goods including agricultural research and technologies, transportation, and market information that, from an economic efficiency point of view, should be provided anyway. It is unfair to argue that smallholders cannot "compete" when they do not have the same opportunities for access to inputs and public goods as larger farmers.

On the other hand, the *minifundistas* seem particularly vulnerable to competitive pressures. Not all small farmers are *minifundistas*, and being a *minifundista* does not necessarily mean that the household is poor, but *minifundios* are frequently too small to generate all the income necessary for household survival. A study of Mexican *campesinos*, using census data, showed that 64 percent had insufficient agricultural land to provide food for the

Table 7—Marketed share of food crops by smallholder farmers, mid-1980s

| | Rice | Wheat | Maize | Other food crops | Share in crop land |
|-------------|------|-------|-------|------------------|--------------------|
| Bolivia | 15 | 20 | 30 | 30 | 13 |
| Chile | 6 | 9 | 6 | 12 | 11 |
| Costa Rica | 10 | ... | 10 | 10 | 1 |
| Ecuador | 25 | 27 | 53 | 40 | 8 |
| El Salvador | 30 | ... | 30 | 30 | 12 |
| Guatemala | 7 | 32 | 24 | 34 | 20 |
| Honduras | n.a. | n.a. | 20 | 20 | 18 |
| Mexico | 35 | 35 | 35 | 35 | 12 |
| Panama | 15 | ... | 15 | 20 | 9 |
| Paraguay | n.a. | n.a. | 20 | 25 | 3 |

Source: Jazairy, Alamgir, and Panuccio 1992.

Notes: This source defines a "smallholder farmer" as one who operates less than three hectares of cropland. Nevertheless, it notes that the methods of data collection and the definition of concepts involved sometimes differ from country to country, and so the figures should be treated with caution. N.a. means not available; ... means not applicable.

⁴The maximum amount of land these "family units" could hold is 47.1 million hectares. Chiriboga (1994) bases these statistics on agricultural census and survey data from 16 countries. Distinguishing between a *minifundista* and a smallholder is difficult because *minifundismo* describes a production context, not a farm size. Most analysts use *minifundista* to describe a farmer whose holdings are too small (or lack the resource endowment) to provide sufficient food and livelihood for a family without off-farm work. A smallholder would have enough land to support a family and often uses modern agricultural technologies and participates in the market. The point at which the transition from a *minifundista* to a smallholder occurs varies by agroecology, investment level, technological choices, and so on (personal communications with G. Bergeron, J. Melmed-Sanjak, and B. Reydon in April 1997). Chiriboga (1994) does not specify his classification criteria, but clearly the precise cutoff would vary by study and local context.

family, and only 10 percent had enough to support a family (Schejtman 1994). These households often augment their income with off-farm work. Remittances from relatives who work outside the household, often in the cities, are another source of additional income.

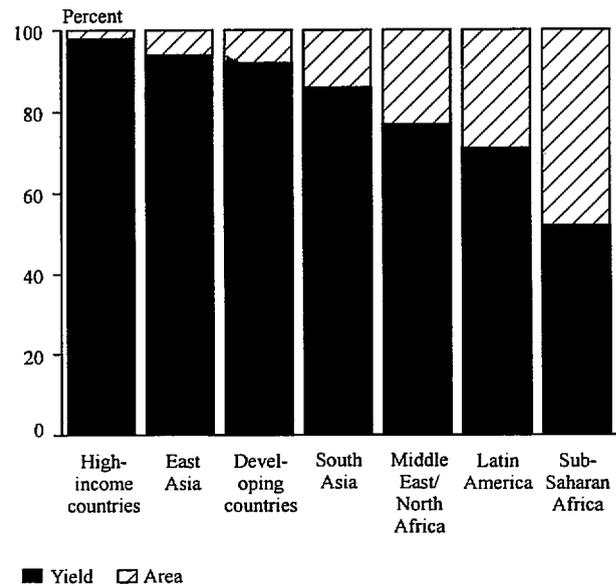
Despite the predominance of the *minifundio* among Latin American landholdings, relatively little consolidation of landholdings has occurred in the past 25 years (Schejtman 1994). In fact, the number of *minifundios* actually grew 47 percent, from 7.9 to 11.7 million farms, between 1980 and 1990 (Kaimowitz 1995). Part of the reason for the lack of consolidation may be that land ownership is already highly concentrated, or the costs of sorting out property rights and bringing together small and geographically separate plots may be prohibitive. Until laws and regulations governing property rights are changed, it is unlikely that much consolidation of the *minifundista* and smallholder sectors will occur, even with changes in economic policy. On the other hand, concentration of the value of production has occurred in recent years, suggesting that the value of production per hectare among the largest producers went up relatively more than that of smallholders, including *minifundistas* (Schejtman 1994).

Agricultural Technologies

Past growth in agricultural production owes a great deal to technological advances that have produced higher yields, rather than an expansion of land under cultivation. Seventy-one percent of the growth in cereal production in Latin America from 1961 to 1990 was due to increases in yield, with expansion of area under cultivation accounting for the remaining 29 percent (Figure 11).

Still, productivity remains low for most crops in the region, even though existing technologies could dramatically increase productivity. For instance, average yields in the Andean region for beans, a major hillside crop, are only 85 percent of the average yield in Colombia, a country that is representative of the agroecological conditions throughout the region. Similar situations apply to rice, wheat, potatoes, soybeans, and maize (Pachico, Ashby, and Sanint 1994; FAO 1994b).

Figure 11—Contribution of increases in area and yield to growth in cereal production, 1961–90



Source: World Bank 1992.

Up to now, productivity gains have been achieved mostly by abandoning traditional farming practices and increasing the use of inorganic fertilizers and agrochemicals, access to irrigation, and use of improved seed. According to the statistics of the Food and Agriculture Organization of the United Nations (FAO 1995), fertilizer consumption in Latin America and the Caribbean grew from an average of 3.6 million tons in 1971–73 to about 8.0 million tons in 1991–93 (Table 8). Use of fertilizers grew by 71 percent from 1971–73 to 1981–83, and then by only 30 percent from 1981–83 to 1991–93, with most of the increase coming from South America. Data in Table 9, however, suggest that Latin American consumption of fertilizers was well below the average for developing countries in 1988–90, indicating some scope for increased use.

Irrigated area in Latin America, now about 16 million hectares, grew by 3.1 percent per year from 1971 to 1981 and 1.4 percent per year from 1981 to 1990 (Pinstrup-Andersen and Pandya-Lorch 1994). This aggregate statistic obscures the fact that in many countries irrigated area has hardly grown at all since the 1960s (Table 10). Costa Rica, El Salva-

Table 8—Fertilizer consumption, selected three-year averages, 1971–93

| Region | 1971–73 | 1981–83 | 1991–93 |
|--|---------------------|---------|---------|
| | (1,000 metric tons) | | |
| Latin America and the Caribbean | 3,617.5 | 6,183.9 | 8,015.3 |
| Mexico, Central America, and the Caribbean | 1,376.9 | 2,643.5 | 2,550.8 |
| South America | 2,240.6 | 3,540.3 | 5,464.4 |

Source: FAO 1995.

Table 9—Average fertilizer consumption on selected crops, 1961–63 and 1988–90

| Region/crop | 1961–63 | 1988–90 |
|---------------------------|----------------------------|---------|
| | (kilograms of NPK/hectare) | |
| Central America, on maize | 9.76 | 63.45 |
| South America, on rice | 13.16 | 94.29 |
| South America, on maize | 11.29 | 54.19 |
| All developing countries | 6.51 | 82.14 |
| All developed countries | 44.80 | 116.19 |
| World | 25.65 | 98.08 |

Source: Oram and Hojjati 1994.

Note: NPK is nitrogen, phosphate, and potassium.

dor, Mexico, and Peru are exceptions. Of these, only Mexico is one of the largest producers in Latin America, and even it did not expand area under irrigation in the 1980s. It has been estimated that irrigated area could potentially expand to 20 million hectares (Gallopín, Winograd, and Gómez 1991).

Because of the potential for damage to health and the environment, however, the growing use of agrochemicals without improved knowledge at the farm level of their effects and their appropriate use and application is worrisome. Pesticide use, measured by the value of trade and adjusted for inflation, increased 9 percent between 1971–73 and 1981–83, and 17 percent between 1981–83 and 1991–93. Insecticide use increased 67 percent and herbicide use 146 percent from 1981–83 to 1991–93 (FAO 1995). Lack of information about proper and effective use can lead to excessive application of chemical pest and disease control products. Fifty of the 250 chemicals in use in Colombia are banned elsewhere, a situation that also exists in other Andean and Central American countries. Excessive and careless use of highly toxic chemicals also represents a significant health hazard for rural laborers; it can harm plants and animals needlessly, com-

Table 10—Percentage of agricultural land irrigated, by country, 1965, 1981, and 1991

| Country | 1965 | 1981 | 1991 |
|--------------------------|-----------|------|------|
| | (percent) | | |
| Largest producers | | | |
| Argentina | 5 | 6 | 6 |
| Brazil | 1 | 3 | 4 |
| Colombia | 7 | 8 | 10 |
| Mexico | 3 | 20 | 21 |
| Others | | | |
| Bolivia | 5 | 7 | 7 |
| Chile | 30 | 30 | 29 |
| Costa Rica | 9 | 12 | 22 |
| Ecuador | 26 | 21 | 20 |
| El Salvador | 4 | 15 | 16 |
| Guatemala | 4 | 4 | 4 |
| Honduras | 5 | 5 | 5 |
| Panama | 1 | 5 | 5 |
| Peru | 4 | 33 | 34 |

Source: Jazairy, Alangir, and Panuccio 1992 (for 1965 data); USAID 1995 (for 1981 and 1991 data).

pounding the problem of high rates of deforestation and loss of biodiversity (Trigo 1995).

Some analysts suggest that the next major gains in productivity will come from biotechnology. These technologies offer the opportunity to overcome many of the obstacles limiting further production and productivity gains while at the same time improving resource management. Scientists now understand better the mechanisms that determine complex traits like improved photosynthetic efficiency and tolerance to drought, frost, and poor soils. Pest- and disease-resistant and herbicide-tolerant varieties of soybeans, cotton, alfalfa, sunflowers, and potatoes already are or soon will be available (Trigo 1995).

Although the potential is large, the actual gains to be made in agricultural production in Latin America in the next two decades from biotechnology will probably be small. Any advances will probably be used by the more technologically advanced farmers first, and generalized use can be expected only by 2010 or so. Additionally, progress in achieving productivity increases for wheat, maize, and rice—important cereal crops—has been slower for technical reasons. In the near term, progress will mostly involve improvements in research methodology and diagnostics (Trigo 1995).

The current lack of financial and human resources available to work on biotechnologies will also slow their development. By the early 1990s there were about 150 researchers working in biotechnology-related projects in the region, most at universities or at advanced research centers, such as the international centers of the Consultative Group on International Agricultural Research (CGIAR). Only 33 research groups in the region have well-established capacities in traditional biotechnologies and only 6 have capacity in modern molecular biotechnology (Trigo 1995).

Agricultural Research Institutions

Agricultural research and technology transfer in Latin America are also undergoing dramatic institutional change. Even as research institutions face new demands to develop technologies that are environmentally friendly and location specific, investment in public agricultural research has declined precipitously. Between 1977 and 1992 research investment in the region grew only 1.5 percent a year, compared with an average growth rate of almost 6 percent per year in the period 1967–77. At the same time, the resources available per researcher in every country but Colombia and Argentina have decreased. Since 1991, research budgets in real terms for the Instituto Nacional de Tecnología Agropecuario (INTA) in Argentina, Instituto Colombiano Agropecuario (ICA) in Colombia, Empresa Brasileira de Pesquisa Agropecuária (EMBRAPA) in Brazil, and Instituto Nacional de Investigaciones Forestales, Agrarias, y Pecuarias (INIFAP) in Mexico, the four largest insti-

tutions for agricultural research in the region, have fallen systematically. Extension agencies have undergone even more dramatic declines. As agriculture became more complex, agencies were unable to respond to farmers' needs; their reputations became so poor that many governments eliminated extension services entirely (Trigo 1995).

Now, there is a clear impetus to rely more on institutions at the municipal level or on the private and nonprofit sectors to develop and disseminate technologies rather than the national government (Trigo 1995). Argentina and Brazil have decentralized their research programs. In Colombia, ICA has promoted regional technical assistance agencies at the municipal level (Chiriboga 1994). Private businesses and nongovernment organizations (NGOs) have increased their involvement in research and technology transfer activities.

Still, direct private investment in agricultural research and development remains a very small proportion of total national investment in agricultural research. And, aside from difficulties with coordination and their lack of installed institutional capacity, the initiatives undertaken by international agencies, research foundations, and NGOs are not enough to compensate for the retreat of public sector institutions. Of particular concern is the bimodal nature of production in Latin America, which tends to result in uneven development and application of agricultural technologies. Larger producers receive most of the information about new products and techniques. Smaller farmers and those in remote areas are in danger of being left behind in the process of technological change.

6. Trade Reform, Regional Integration, and Agriculture

Trade liberalization has been a key element of the economic adjustment programs of the region, and as relative price incentives change, it will be one of the key factors in the future development of agriculture (Trigo 1995). Indeed, an often explicit expectation of liberalization programs was that they would generate growth by stimulating exports, especially agricultural exports, which were seen as the region's outstanding comparative advantage. With the implementation of the North American Free Trade Agreement (NAFTA), the region's efforts at trade liberalization and integration have been revitalized.

The trade and macroeconomic policies that characterized the inward-looking, urban-focused industrialization strategy of growth prevalent until the 1980s often discriminated against agriculture, so much so that the performance of the agricultural sector in Latin America has been determined, to a large extent, by policies with economy-wide impact, like trade and macroeconomic policies, rather than sector-specific policies (García García 1989). Government taxation schemes drained agricultural surplus in order to subsidize more industrial sectors. Overvalued exchange rates hurt agricultural exports, while making industrial imports artificially cheap (García García 1989).

These policies depressed the agricultural sector, considerably reducing the standards of living of the rural population and lowering the overall rate of

economic growth. The losses were not small. For example, by depressing agricultural prices, labor demand was restricted, and over the period 1960 to 1983, real wages in rural Colombia were 15 percent below what they would have been otherwise. In Argentina, the transfer of wealth from agriculture to the rest of the economy sometimes reached 50 percent of the value of agricultural output (García García 1993). By impoverishing agriculture, these policies encouraged rural-urban migration, thus contributing to the problem of urban under- and unemployment (García García 1989).

Although general macroeconomic policies discriminated against agriculture, the largest, most commercial producers often received special dispensations, like protection against imports and subsidized credit, to compensate for the negative effects of macroeconomic policies. And in many countries, such as Peru and Bolivia, in line with state favoritism of industry, policies actively promoted agroindustries, rather than agriculture itself (Lajo 1988; Ybarregaray de Paz 1992).

The broad reforms in trade and macroeconomic policies of the 1980s and 1990s to a large extent reversed systematic discrimination against agriculture and renewed emphasis on trade integration.⁵

These reforms did not occur suddenly but built on earlier efforts at regional integration. The Latin American Free Trade Association (LAFTA) and the Central American Common Market (CACM)

⁵Valdés (1996) notes that some countries still discriminate against agriculture. In a study of eight Latin American and Caribbean countries, he found that among those countries that taxed agriculture heavily before reforms (Argentina, Dominican Republic, Ecuador, and Uruguay), Ecuador and Uruguay still tax the sector heavily (transfers in 1993 of -46.5 percent and -14 percent of agricultural GDP, respectively). Argentina and Brazil have significant transfers into or out of agriculture and the rest of the economy. Colombia has positive net transfers of about 11 percent of agricultural GDP. He also found that in most countries, the gains and losses are concentrated in a few products. For example, in the Dominican Republic, rice producers capture a high share of the total transfer to agriculture, while sugar growers are taxed. In Uruguay, main income losers are producers of beef, wool, and milk.

were founded in 1960, the Andean Pact was established in 1969, and the Caribbean Community and Common Market dates from 1973. NAFTA grew out of the Canada-U.S. Free Trade Agreement and MERCOSUR (Common Market of the South) out of the Brazilian Integration Act and subsequent bilateral agreements. Current attempts to liberalize bilateral and multilateral trade in the region are themselves elements in a process that, in accordance with the 1994 Summit of the Americas agreement, should result in a Free Trade Area of the Americas by the year 2005 (Lee 1995).

These earlier regional trade arrangements never fulfilled their creators' hopes. Problems of payment and policy coordination, continuation of exchange regulatory controls and other import substitution policies, the limited number of commodities included in the agreements, and, ultimately, small market sizes prevented the realization of benefits from specialization and economies of scale (Bouzas and Ros 1994; Bernal 1993). The early 1980s saw further disintegration of the trade arrangements with internal political and economic crises and contraction of import demand.

On the other hand, current reforms have been substantial and broad based. At present, more than 50 different bilateral and multilateral trade agreements, including customs unions, free trade arrangements, and sectoral agreements, are in place (Lee 1995). Across the region, average national tariff levels have dropped from 45 percent in the mid- to late 1980s to below 20 percent (Naím 1994; Ramos 1993). The tariff structure has been greatly simplified and streamlined (reduced from as many as 30 different rates to no more than 7) and in some cases a uniform tariff has been applied to all imports (Lee 1995). Nontariff barriers have also been reduced or eliminated. For example, in Mexico, the percentage of imports subject to advance permit requirements has been reduced from 90 percent to less than 20 percent (Ramos 1993).

Partially in response to these reforms, trade volume as a percentage of GDP grew from an average of 47 percent to 56 percent, about 25 percent from 1985 to 1992 for most countries in the region (Lustig and Primo Braga 1994). Total export value of trade by Latin America and the Caribbean in-

creased by more than 81 percent between 1986 and 1992. Trade within the region has increased even more rapidly, by 135 percent (Naím 1994). These increases, however, are from relatively low levels, even by historical standards. Intraregional trade now accounts for only 18 percent of total exports, a 40 percent drop from the 1970s and early 1980s (Naím 1994).

The overall regional effect of these reforms will be driven by only a few countries. It is estimated that almost 90 percent of export expansion from hemispheric free trade will accrue to just two countries, Brazil and Mexico, because economic activity and trade in the hemisphere is so highly concentrated (Lee 1995). For instance, 42 percent of Latin America's exports go to the United States, and half of these are from Mexico. If Mexico is excluded from the calculations, only 28 percent of Latin American exports go to the United States (Naím 1994). The direct consequence of NAFTA for non-participating countries in the region is likely to be modest trade creation that will offset, and perhaps slightly exceed, trade diversion effects (Aninat 1995). Still, for individual countries, the impact can be substantial.

The makeup of intraregional trade differs considerably from trade with the rest of the world. For example, in 1994, exports to destinations outside the hemisphere were dominated by natural resource and labor-intensive products, while agricultural exports were only a small proportion of intraregional trade. These patterns are due to several factors, including widespread agricultural import protection and the common comparative advantages of many Latin American exporters (Lee 1995).

Additionally, despite broad reform, agriculture is often treated as a special case under trade agreements. NAFTA, for example, has separate bilateral agreements between member countries for agriculture, and the CACM and MERCOSUR permit some exceptions for agricultural products specific to each country (Lee 1995). Nevertheless, in comparison with past controls, restrictions on agricultural trade, including taxes, have been significantly reduced.

Perhaps partially as a result of these remaining restrictions, agricultural exports as a percentage of total exports have declined from an average of 24

percent in 1971–73 to 12 percent in 1991–93 (Lee 1995). Still, the value of agricultural exports by the major regional trading groups to other Western Hemisphere destinations increased for every group except the Caribbean between 1981–83 and 1991–93 (Table 11).

Given the region's outstanding natural resource base, the food and agricultural system should lead economic growth, but the contribution of trade to growth is as yet uncertain. Clearly, reform alone is not a sufficient condition for growth. Since the reform program of 1985, Bolivia has become one of the most open economies in the world, yet its recent economic growth has been quite modest, especially compared with the rates of the 1970s (Morales 1992 cited in Agosin and French-Davis 1993).

Valdés (1996) notes that agricultural price and trade reform is occurring against a backdrop of significant declines in agricultural profitability, as reflected in the decline of real farm prices of tradables in domestic markets. In Brazil, real prices fell 65 percent during 1986–89, and in Argentina prices fell 52 percent between 1990 and 1993.

Too, although macroeconomic stability helped renew trade growth in the past decade, macroeconomic conditions may now contribute to a slow-

ing of growth in trade. As noted by Valdés, large capital inflows have driven up currency values in many cases, stifling exports and encouraging imports. The hardship experienced by Latin American agriculture as a result may increase political pressures to slow the pace of trade reform. And for truly free trade to occur, export markets must remove restrictions as well.

Another question is the continuation of the impetus for reforms. Some analysts believe these regional trade agreements are building blocks to greater regional integration (Lustig and Primo Braga 1994). Others think they are only stumbling blocks that consolidate resistance to further integration. These analysts further argue that the free trade agreements are not about free trade but about foreign investment and the need to not be left out of organizing economic blocs. They note that most exports from Latin America already enter the United States untaxed. In fact, only 18 percent of Latin American exports encounter tariffs of more than 5 percent (Naim 1994).

The aims of efficiency and growth, however, mandate a lowering of trade barriers just to get the prices "right," even if large increases in regional trade do not result. To be competitive, the region

Table 11—Average Western Hemisphere agricultural exports, 1981–83 and 1991–93

| Regional grouping | Agricultural exports | | | | |
|--------------------|-------------------------------|-------------------------|--|-------------------------|--|
| | Total value (US\$ million) | To Western Hemisphere | | Within group | |
| | | Value (US\$ million) | Share of total exports (percent) | Value (US\$ million) | Share of total exports (percent) |
| 1981–83 | | | | | |
| NAFTA | 47,329 | 10,479 | 22.1 | 6,472 | 13.7 |
| MERCOSUR | 16,769 | 4,003 | 23.9 | 827 | 4.9 |
| Andean group | 3,337 | 1,497 | 44.3 | 127 | 3.8 |
| CACM | 3,009 | 1,556 | 51.7 | 173 | 5.7 |
| G-3 | 3,916 | 2,058 | 52.6 | 72 | 1.8 |
| Caribbean | 1,707 | 722 | 45.2 | 72 | 4.2 |
| Western Hemisphere | 73,460 | 18,844 | 25.6 | ... | ... |
| 1991–93 | | | | | |
| NAFTA | 54,671 | 19,338 | 35.4 | 15,798 | 28.9 |
| MERCOSUR | 18,074 | 5,317 | 29.4 | 1,878 | 10.4 |
| Andean group | 5,022 | 2,359 | 47.0 | 424 | 8.4 |
| CACM | 3,694 | 2,074 | 56.1 | 164 | 4.4 |
| G-3 | 6,118 | 4,284 | 70.0 | 216 | 3.5 |
| Caribbean | 1,838 | 598 | 32.5 | 70 | 3.8 |
| Western Hemisphere | 86,179 | 30,960 | 35.9 | ... | ... |

Source: Lee 1995.

Note: Leaders indicate not applicable.

will have to work to be an efficient, low-cost producer, flexible enough to respond quickly to changing market conditions. This means increased productivity, which will require investment in the

people of rural areas, including their education and health; the development of market infrastructure, including transportation and communications; and investment in research and extension activities.

7. Natural Resources: Threats and Opportunities

The goal of making agriculture internationally competitive cannot be achieved if the region depletes or degrades the underlying source of such changes: the region's own natural resources. Although precise information about how human activities are affecting the environment is often lacking, available data indicate that environmental deterioration in Latin America is at worrisome levels. Given the richness of the region's resources and their importance to the region's growth and to the world's food supply and environmental health, continued losses will be devastating.

In terms of natural resources, Latin America is one of the wealthiest regions in the world. With 8 percent of the world's population, it has 23 percent of the world's potentially arable land, 12 percent of its cultivated land, 46 percent of its tropical forests, and 31 percent of the world's fresh water. It is estimated that between 1,000 and 2,000 vegetable species may inhabit 1 hectare of the Amazon forest—more species than in all of Europe (IICA 1991). Despite this favorable overall resource profile, regional ecosystems exhibit substantial differences. In the highlands of Peru, only 20 percent of usable land is cultivated, whereas some countries in Central America exploit almost all of their potential agricultural land.

Latin America has about 700 million hectares of potentially cultivable land area, almost 35 percent of total area (Gallopín, Winograd, and Gómez 1991). In 1992–94, an average of 140 million hectares, or 7 percent, were in permanent crops. According to Gallopín, Winograd, and Gómez (1991), Latin America could feed its population in the year 2030 by cultivating only 4 percent of its land with land- and input-intensive production techniques and using extensive production technologies on another 20 percent. This is partly because two-and-a-half harvests of short-cycle crops can be made per year in tropical and subtropical

areas of the region, which make up some 65 percent of the land (Gallopín, Winograd, and Gómez 1991).

Soil Degradation

Soil degradation poses a serious threat to the sustainability of agricultural production. Two hundred million hectares of land in Latin America, almost a third of total vegetated land, are now moderately or severely degraded. Eighty percent of the total and 70 percent of the most degraded land is found in South America. Experts judge that in Central America agricultural activities were responsible for almost half of all soil degradation there, while deforestation was the primary cause in South America (Table 12). Moderate to severe land degradation in the 1980s has been placed at 155 million hectares,

Table 12—Extent and causes of human-induced soil degradation in Latin America since 1945

| | Central America and Mexico | South America | World |
|--|----------------------------------|------------------|-------|
| Degraded area (million hectares) | | | |
| Moderate to extreme | 61 | 139 | 1,215 |
| Light | 2 | 105 | 749 |
| Share of vegetated land degraded (percent) | | | |
| Moderate to extreme degradation | 24.1 | 8.0 | 10.5 |
| Light degradation | 0.7 | 6.0 | 6.5 |
| Causes of soil degradation (percent) | | | |
| Deforestation | 22.0 | 41.0 | 30.0 |
| Overexploitation | 18.0 | 5.0 | 7.0 |
| Overgrazing | 15.0 | 28.0 | 35.0 |
| Agricultural activities | 45.0 | 26.0 | 28.0 |
| Industrialization | ... | ... | 1.0 |

Source: Oldeman, van Engelen, and Pulles 1990.

Notes: These results are from a three-year study that asked more than 250 soil scientists and regional coordinators for their estimates of human-induced soil degradation since World War II. Leaders indicate not applicable.

with 113 million due to erosion caused by water and 42 million due to wind (Latin America and Caribbean Commission 1991 cited in Gligo 1995).

Acceleration of erosion in the region is attributed especially to the expansion of the agricultural frontier and overuse of land. The expansion of agriculture, especially in the Andean highlands, has led to the use of land so high and steep that it is particularly fragile (Gligo 1995).

The figures for erosion vary from one country to another and depend on the type of activity undertaken, but in the mountainous zones of Latin America between 40 and 60 percent of the area has problems with erosion. In Jamaica, about 16 percent of the land area is gravely eroded, losing between 100 and 125 tons of soil per hectare per year. In Guatemala, soil loss in forested areas varies from 20 to 300 tons per hectare per year, while in deforested areas it rises to 700 to 1,100 tons per hectare annually. Such significant soil erosion can quickly diminish productivity and reduce the estimated useful life of hydroelectric plants, which are particularly important to electricity generation in Central America (Gallopín, Winograd, and Gómez 1991).

In some instances, poorly designed irrigation systems have increased salinization and alkalization of the soils. In Latin America at the end of the 1980s, 1.35 million square kilometers (about 6.6 percent of total land) had been affected by salinization. In Mexico, 12 percent of irrigated land was affected by salinization, and in Argentina the figure

was 38 percent (Gallopín, Winograd, and Gómez 1991).

Deforestation

Table 13 shows how land use in Latin America changed from 1972–74 to 1992–94. Overall, the proportion of land in permanent crops and pasture increased in every region while the share in forests and woods declined. In 1972–74, almost half the land area was covered in forest. Twenty years later, 60 million hectares—6 percent of the forest—had been lost to other uses.

Deforestation, a major cause of land degradation and loss of natural resources, can lead to the alteration and decline of ecological systems, including watersheds and their capacity to regulate waterflows, microclimates owing to loss of vegetative cover, and biological diversity owing to the destruction of systems that ensure change.

Since 1960, more than 200 million hectares of forests have disappeared. In Central America, almost half the forest has been destroyed since then (Pachico, Ashby, and Sanint 1994). During the 1980s, 5.9 million hectares of dense forest and 1.1 million hectares of other types of woods and shrublands were deforested each year. This amounted to about 0.7 percent of the forest annually. Deforestation in Central America occurred at a rate of 1.6 percent per year (FAO as cited in Gligo 1995; Gallopín, Winograd, and Gómez 1991). Although the proportion of forest land lost is smaller in South

Table 13—Land use in Latin America and the Caribbean, 1972–74 and 1992–94

| Country or region | Total land (1,000 hectares) | Permanent crops | Pasture | Forest and woods (percent) | Other |
|-----------------------------------|--------------------------------|--------------------|---------|-------------------------------|-------|
| 1972–74 average | | | | | |
| Latin America and the Caribbean | 2,006,339 | 6 | 27 | 49 | 17 |
| Mexico | 190,869 | 12 | 39 | 27 | 21 |
| Central America and the Caribbean | 72,591 | 16 | 22 | 39 | 23 |
| Brazil | 845,651 | 4 | 19 | 63 | 13 |
| South America, except Brazil | 897,228 | 6 | 33 | 41 | 20 |
| 1992–94 average | | | | | |
| Latin America and the Caribbean | 2,006,340 | 7 | 29 | 46 | 18 |
| Mexico | 190,869 | 13 | 39 | 26 | 22 |
| Central America and the Caribbean | 72,578 | 18 | 27 | 36 | 19 |
| Brazil | 845,651 | 6 | 22 | 58 | 14 |
| South America, except Brazil | 897,242 | 6 | 34 | 39 | 20 |

Source: FAOSTAT 1996.

Note: Figures may not sum to 100 percent because of rounding.

America than in Central America, the actual amount of land deforested is far greater in South America, because of its larger size. The largest amounts of deforested land are found in the Amazon basin (Kaimowitz 1995).

A principal cause of deforestation is expansion of the agricultural frontier, which is caused by a number of factors. Farmers may clear forests as they are expelled from traditional production areas or exhaust the fertility of the soil there. The building of roads in new settlement areas or to formerly isolated areas can also stimulate the occupation and deforestation of large tracts of land. Production subsidies, such as tax exemptions intended to promote cattle ranching, have also been cited as causes of deforestation. Logging, for both industrial and household use, is another factor. In Latin America, 80 million people, many of them poor, cook with charcoal, consuming between 350 and 700 kilograms per year per person (Gligo 1995).

Loss of Biodiversity

The shrinkage of habitats, mainly as a result of deforestation, coastal pollution, and the alteration of wetlands, could lead to an important reduction in the region's biodiversity. Unfortunately, assessments of biodiversity tend to be scarce and confined to small areas from which it is difficult to generalize to the region (Gligo 1995).

The destruction of species could mean loss of important benefits. One source estimates that 10,000 new plants are waiting to be discovered. The potential benefit of these new species has been amply demonstrated: more than 35 percent of the food products in the world have their origins in Latin America. In 1970, a historical ancestor of today's corn, found in Mexico, was used to combat a fungus that had attacked and destroyed 80 percent of the U.S. corn crop (Gallopín, Winograd, and Gómez 1991).

Water Resources

The region's hydrological resources also have problems. They suffer chemical and biological contamination, watershed degradation, and flooding. Deforestation has contributed to degradation, and indiscriminate use of inorganic fertilizers and pesticides like DDT has contributed to contamination. In

Colombia, some rivers are now considered biologically dead (Gallopín, Winograd, and Gómez 1991). And, because no Latin American city on the Pacific has a waste treatment plant, harmful industrial and agricultural wastes there flow straight into the ocean (Gligo 1995).

The principal problem with marine resources is that selective exploitation has diminished the population of some important commercial species while failing to take advantage of others. For example, on the Colombian coast, 5 of 30 potentially commercial fish species account for 85 percent of the catch. In Central America, in the period 1977-82 overfishing diminished lobster catches by 41 percent and anchovy by 66 percent. Although most fisheries are being heavily exploited, there is still some potential for growth. In the late 1980s, FAO (1988) estimated potential capture ranging from 16.4 to 23.7 million tons while actual capture was only 10.5 million tons. The greatest area for growth appears to be the southwestern Atlantic, especially off the Argentine coast (Gallopín, Winograd, and Gómez 1991).

Causes of and Responses to Environmental Degradation

Environmental degradation can be difficult to control, particularly since it is largely related to poverty and lack of opportunities for agricultural intensification (Pinstrup-Andersen and Pandya-Lorch 1994). In addition to constraints imposed by their own poverty and frequently unfavorable policy environments, many poor farmers lack access to markets and inputs, such as credit and technologies appropriate to their size or environmental conditions. As they struggle to extract a living from their small plots, these farmers exhaust the land. The resulting decline in production hastens their descent into poverty. This struggle for short-term survival conflicts with farmers' instinct to conserve the natural resources that form the basis for sustained agricultural production. Successfully dealing with rural poverty and underdevelopment can thus improve poor farmers' well-being and reduce pressures on the environment.

Of course, intensification of production and consequent increases in income do not always re-

duce environmental degradation. In fact, agricultural "success" can lead to environmental disaster if it is not properly managed. When resources are not an integral part of the production system, then the incentives for sustainable management of the resource base are not strong. The private economic incentives for cattle ranchers to leave the tropical forest standing are minimal because the forest does not fit into their typical production pattern, for example.

It would be simplistic, then, to believe that only poor farmers are responsible for environmental degradation and that by eliminating poverty, environmental destruction will be eliminated, too. Environmental problems are also caused by the socially powerful and affluent, including the state. The wealthy, however, often have access to alternative sources of income, have other places to live, or have political influence that allows them to avoid the direct consequences of their actions. The poor typically have fewer technological and productive options, and so, although the strategy is disastrous in the long run, the poor have little choice but to continue to overexploit and degrade their environment as they eke out a living (Gallopín, Winograd, and Gómez 1991). Prevailing socioeconomic incentives and conditions encourage both rich and poor to act in ways that degrade natural resources, and in the end, all of society suffers.

The threats to the region's natural resources cannot be solved simply through an increase in technological knowledge. As Gligo (1995) notes, experts in Latin America know what techniques can prevent soil erosion. They know about contouring, about which crops will hold the soil in place, about

the roles of forests and microfauna. Yet the land continues to be eroded and forests continue to fall. Experts also know how to reduce and treat industrial and agricultural effluents to make cleaner water. Yet water continues to be contaminated.

Indeed, Gallopín (1992) concludes that there are no significant ecological or technological constraints, at the level of the region as a whole, to generate sufficient sustainable production to meet food needs. Even where more research is needed and knowledge of the ecosystem is incomplete, many socially, economically, and ecologically suitable sustainable management techniques for a variety of ecosystems already exist.

Undoubtedly, though, productivity-increasing and resource-conserving technologies constitute a powerful means to alleviate poverty and protect the natural resource base. The upgrading of traditional technologies will become especially important for medium- and small-scale producers. Many traditional technologies are better adapted to local conditions and ecological cycles than "modern" technology. Technological blending of new and old techniques could improve yields, gaining the best of both (Gligo 1995).

Technological advances alone can only be part of the answer. Technologies that will be attractive to farmers, especially poor, resource-constrained farmers, must be made available. Appropriate policies and infrastructures must exist to encourage adoption of "win-win" technologies that will increase productivity and incomes while maintaining or improving the natural resource base. Only then can the full benefit of technological advances be realized.

8. Institutional Change, Decentralization, and Privatization

Even as the region seeks the appropriate combination of policies to maximize human and economic development without harming the environment, the institutional arrangements critical to the development of those policies are being radically revised. Economic reforms of the state in Latin America in the 1980s were often accompanied by, though not necessarily linked to, reforms in the political role of the state, particularly the decentralization, privatization, and deregulation of markets.⁶ Changes in institutional responsibilities and structures are altering the way in which the state, the private sector, and civil society interact.

Reforms have the potential to energize the economy and strengthen democracy. Effective decentralization is not a necessary or sufficient condition for democracy, but it can potentially broaden participation in political processes. With such increased participation, decentralization may in fact be the best way to link growth with poverty reduction, although, as is clear from the experience of the United States, democratic institutions in themselves do not guarantee elimination of inequality or poverty.

Perhaps the most profound institutional reform has been market liberalization and deregulation, which has eliminated government intervention in pricing, marketing, and production, effectively privatizing these activities. Institutional reform is more commonly thought of as turning over the provision of goods and services to the private sector or

to NGOs or as decentralizing functions from the central to local and regional governments. The role of the central state is also changing as policies, especially in trade and the environment, are increasingly being set by international organizations. Some see this as a spiraling away of the sovereign power of the national state, as global organizations acquire more power to determine national policies, and as the central government gives fiscal and administrative responsibility to local and regional governments.

The increasing attention paid to the environment and natural resources and to trade has led some countries to establish departments or even ministries separate from the Ministry of Agriculture to deal with these issues. However, in some countries, the increasingly important responsibility of representing the nation's agricultural interests before global trade organizations has given the Ministry of Agriculture renewed visibility (IICA 1996b).

In general, the process of decentralization resulted from macroeconomic changes and pressure to modernize the state as well as a growing demand for democracy by Latin American society (Chiriboga 1994). The specific motivations behind efforts at decentralization in the 1980s and 1990s varied from country to country. In Colombia, for instance, movements to decentralize in the late 1970s came about in response to civil strikes; in the early 1980s, they resulted from a need to relieve the central government's fiscal deficit. It was not until 1986 that

⁶As Chiriboga (1994) points out, there are distinct categories of decentralization. Administrative decentralization from the central to lower levels of government can be termed "deconcentration." Political decentralization involves the transfer of authoritative fiscal and policymaking power from the central to lower levels of government. In a broad sense, decentralization could even be thought of as economic reform: privatization devolves the state's responsibility to the private sector, and deregulation gives the state's role to the market. This paper uses the term "decentralization" to mean either administrative or political decentralization.

the first fundamental law on decentralization was adopted. In Brazil, decentralization emerged as a theme in reaction to the centralization of power under military regimes (Rojas 1994).

Rather than being a direct consequence of the 1985 program of structural adjustment, the recently enacted Bolivian Law of Popular Participation built on regional divisions of power already present in the country. The ascension to power of a president who was ideologically committed to decentralization and a national dialogue among political elites on the issue also contributed. Many of the efforts at decentralization have concentrated on general fiscal reform or the delivery of social services, particularly to urban areas (Aedo and Larrañaga 1994; López Murphy 1994). Yet, from the beginning of the 1990s, the process of decentralization has also been directed toward rural development.

Through decentralization and encouragement of wider, more intense community-level participation, the aim is to eliminate mechanisms that cause unequal access to resources and public services and to create institutional flexibility that permits the application of policies tailored to the community, region, and type of farmer (FAO 1994a). Decentralization and deconcentration of the government can also lead to the mobilization of resources within the rural community itself, thereby reducing the cost of rural development programs (Chiriboga 1994).

The municipalities become extremely important in this new political scheme. They often must rapidly take on new functions, capacities, and areas of competence. In some countries, they are responsible for preparing and presenting projects to the central level; for promoting rural participation; and for providing technical assistance to *campesinos* and other rural producers. Situations can vary from those where the municipalities function as a liaison between community organizations and NGOs and state or national agencies, as in Argentina, Brazil, and Mexico, to those where municipalities are responsible for developing plans for microregional development, as in Colombia and Bolivia (Chiriboga 1994).

Yet local public institutions in rural Latin America have traditionally been weak or nonexistent, and generally speaking, those who live in rural

areas of Latin America have limited access to public services and institutions. Partially, this is a function of the fact that Latin America has a very low density of local public officials in rural areas, and these officials, in any case, often have limited authority. For example, there is a municipality for every 1,338 square kilometers of territory in Latin America, while in Western Europe, the ratio is one for every 26 square kilometers. In the United States, it is one for every 488 square kilometers (Carvajal 1995).

The general weakness of the institutional capacity of the municipalities, in conjunction with the collapse of the central government during the economic crises of the 1980s in many countries, also opened a path for NGOs to increase their scope of action. They have become increasingly important players in channeling resources, including training, to the neediest as well. They can also provide important, formalized channels of participation in the democratic process.

Private-sector agencies have also increasingly provided goods and services previously provided by the public sector. Producer associations, like the Coffee Growers of Colombia and the Rubber Extractors of Brazil, as well as cooperatives and NGOs, offer agricultural inputs, marketing services, and extension advice, areas previously thought of as being the responsibility of the national or regional government. Private services, like the Federation of Agricultural and Forestry Cooperatives of Honduras, also offer technical assistance (FAO 1994a). The Junta Agroempresarial Dominicana has significant influence over agricultural and agro-industrial policy in the Dominican Republic and even has its own soil laboratory (IICA 1996a).

Some observers warned that decentralization would just transfer analytical and administrative weaknesses to the local level. The lack of financial and human resources would undermine municipalities' ability to articulate their needs and negotiate with national organizations, including the central government (Chiriboga 1994).

In fact, although these are valid concerns, municipalities differ in terms of the human and financial resources they can draw on. Detailed case studies of 16 municipalities in Colombia show that in

most cases, coverage and quality of services improved under decentralization (Garfield 1995). Greater attention was paid to rural areas and to the poor, and in a majority of cases, tax revenues increased. These studies indicate that the political reform process opened the door to leadership and community participation, which proved to be a driving force in improving local capacity and improved provision of services. Garfield (1995) notes, however, that smaller municipalities faced special problems in finding skilled personnel and realizing economies of scale.

Some analysts also argue that, by suppressing central mechanisms for compensation, decentralization will only exacerbate the tendency toward inequality among groups and among regions. Certainly, local governments are open to many of the same corrupting social forces as national governments, and without regional compensation, decentralization could indeed lead to increasing regional and group inequalities (Amtmann 1994). Decentralization does not obviate the need for some form of central government control or transfers to ensure that national needs and priorities are not overcome by regional myopism. There is also a need to avoid domination by local or regional elites and to ensure social or regional equity, because states and lower levels of government have different levels of taxable and economic resources, needs, human resources, and institutional capabilities (Rojas 1994).

Privatization of goods and services that were public runs the same risks. Private companies may not have the incentives or the capacity to carry out functions left to them by the government. Private-

sector organizations have profit, rather than social, motives. The market demand from, say, poor farmers for environmentally friendly techniques and inputs may not be sufficient for private firms to invest in their development. And, at least initially, private companies may simply not have the human or financial resources to meet rural credit needs, for example. Private firm initiative may not be enough in these cases to halt or reverse poverty and environmental degradation.

For decentralization to succeed, the channels for citizen participation must be institutionalized and municipalities must be strengthened. In many countries, national support organizations for municipalities are already in place, such as Mexico's Decentralization and Rural Development Project (Chiriboga 1994). Municipalities may need technical assistance not only to manage their own programs, but also to understand and benefit from links with other municipalities, levels of government, and agencies (Carvajal 1995).

To privatize provision of goods and services effectively, governments must ensure that sufficient public support for market competition exists. Transport and telecommunications infrastructure, especially to communicate price information, and a strong financial system that allows firms to access capital and lowers barriers to entry are crucial. Regulation or market-based incentives will be needed to guarantee that rules necessary for a competitive market are established, respected, and defended, and that companies take the externalized costs of their production, such as pollution, into account.

9. Achieving the 2020 Vision

This overview of food, agricultural, and environmental conditions in Latin America in the past 25 years indicates that in the next 25 years, Latin America as a region will not suffer a food crisis. But millions of families will. Lack of economic opportunity and a deteriorating resource base can only cause the rural poor to push even harder to extract a living from their fragile land or to move on to new forests or hillsides or to the cities. Urban poverty is increasing, with uncertain effects on food security, nutrition, and political stability.

Debates rage about whether the economic and social situations would have been worse without economic adjustment, but it is undeniable that the shift to a new economic and institutional paradigm has not been easy. The greatest challenge for the region in the next 25 years will be to make a sustainable transition to an environmentally friendly, market-oriented economy that aims to raise the incomes and living standards of all people.

Agriculture and the natural resources of the region can provide a firm foundation for the broad-based economic growth necessary to achieve the vision of Latin America described at the outset. Stronger, environmentally friendly agricultural growth will generate additional employment, income, and economic growth in both rural and urban areas; contribute to overall rural development; improve the region's ability to meet growing regional and global food needs; and help to conserve natural resources. Given that so many women, indigenous groups, and poor people participate directly in agricultural production, processing, and distribution, a vibrant food and agricultural system will also promote social and economic equity.

Some decisionmakers may see protection of the environment and natural resources as a bothersome externality that gets in the way of development, but these resources are in fact the basis for sustainable

growth. Seen in this light, agriculture is not merely a stage along the way to industrialization; it is a significant contributor to future growth and prosperity. Degradation of the natural resource base places this future economic growth in jeopardy (Gligo 1995).

Previous strategies for agricultural and rural development centered on the promotion of large, centrally directed rural development projects or on government interventions such as price supports and subsidies. These strategies also implicitly assumed that increases in agricultural production would increase farmer incomes and thereby, along with an emphasis on urban-based industrialization, reduce rural poverty.

These large projects, often heavily reliant on outside resources, frequently proved unsustainable, complex to administer, and impossible to adapt to local conditions (Machado 1994). Moreover, by concentrating on production, governments did not invest adequately in rural market infrastructure or rural people. That poverty, malnutrition, and lack of access to health and education are almost invariably higher in rural than in urban areas shows the human costs of the failure to invest in rural areas.

These and other past experiences provide some guiding principles for achieving the 2020 Vision. The marketplace is now seen as the driving force for economic growth. The issue now is not to have "more government" or "more market," but to have *better* government to increase the effectiveness of the market in promoting growth and to improve the ability of the region to compete at the global level. This requires a stable macroeconomic and institutional setting, including appropriate regulations; appropriate investments in infrastructure such as transportation, information services, and public research on new technologies; the provision and support of a viable financial system; and the strengthening of decentralized, democratic processes.

These actions should be buttressed by investments in education, health, and sanitation that improve nutrition, increase the value of human resources, and ultimately help people to participate and take advantage of the benefits of the market. Institutions that connect citizens with the political process, such as political parties and local associations, must also be supported and improved so that people can actively participate in the making of policy decisions that affect their lives. It is especially critical that these resources be directed to un-

derserved areas, like rural areas, and underserved populations, such as women and children.

Surely the exact steps to take will not always be clear, but a consensus has been reached on the direction of economic and political change in the region. By harnessing the social commitment and political will implicit in this consensus, and by carefully husbanding its natural resources and making substantial investments in its people, the region can achieve the 2020 Vision for Latin America.

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