

Recommendation one

Move from political commitment to action

The world's political leaders have repeatedly committed to ending hunger, but so far have fallen short of achieving this goal. As a quantitative, time-bound goal—first adopted by the World Food Summit (1996), reiterated at the Millennium Summit (2000), and reaffirmed at the World Food Summit five years later (2002) and the World Summit on Sustainable Development (2002)—the hunger Goal enjoys unprecedented global political endorsement. The World Food Summit of 1996 outlined a comprehensive Plan of Action to halve hunger by 2015 and established a system for monitoring progress by the FAO Committee on World Food Security. In addition, the Monterrey Consensus of 2002 promised increased financing for development by both donor countries and developing country governments.

In 2003 the FAO's Anti-Hunger Programme identified priority actions to reach the hunger Goal through investments in agriculture and rural development to enhance direct and immediate access to food for the most seriously undernourished (FAO 2002a). Focusing on small farmers, the Anti-Hunger Programme aims to create more opportunities for rural people, representing 70 percent of the poor, to improve their livelihoods on a sustainable basis. This was followed by the 2003 Maputo Declaration on Agriculture and Food Security in Africa, which recommitted participants to increase their investments in agriculture and rural development and called for expanded official development assistance and debt relief (African Union Assembly 2003). The challenge now is to translate widespread political support into concrete action in the policy, institutional, and budgetary arenas.

To bridge the gap between commitment and results, the global community must translate its promises into greater resource mobilization, heightened public awareness, more participation in planning by the poor and hungry, and greater policy coherence in areas that affect food security and development.

Countries at all stages of economic development must address the structural issues that hamper progress toward eliminating hunger

The Task Force on Hunger puts forward the following five interventions to move from political commitment to action:

1. Advocate political action to meet intergovernmental agreements to end hunger.
2. Strengthen the contribution of donor countries and national governments to activities that combat hunger.
3. Improve global public awareness of hunger issues and strengthen advocacy organizations.
4. Strengthen developing-country advocacy organizations that deal with poverty reduction and hunger alleviation.
5. Strengthen data gathering and monitoring and evaluation.

Background

Moving from political commitment to long-term global action is critical to achieving the hunger Goal. As chapter 2 shows, the world has made some progress in reducing hunger. But achieving the hunger Goal will require a significant acceleration and expansion of hunger reduction efforts, coupled with vigorous processes of policy and institutional reform. Neither can occur without increased action by public leaders.

To back up their commitments, countries at all stages of economic development must address the structural issues (political, economic, and social) that hamper progress toward eliminating hunger. Governments in developing countries need to greatly increase the scale and efficacy of their national hunger reduction programs. Some developing countries—notably India, China, Brazil, Ethiopia, and Sierra Leone—have already begun to back up their commitments by refocusing their efforts to overcome hunger (boxes 4.1 and 4.2). Developed country governments need to increase and improve development

Box 4.1
From commitment to action in China

China's strong economic performance over the past two decades—especially in the 1990s, when economic growth averaged more than 9 percent annually—has led to a massive structural transformation in the Chinese economy and a considerable reduction in poverty. Between 1978 and 2000 the number of poor living on less than \$1 a day fell from 250 million to 30 million (UNDP 2003). And between 1990 and 2000 the number of chronically hungry fell by more than 80 million (FAO 2004c).

Contributing to China's success: policy and institutional reforms that permitted the rural poor to gain access to social services and production assets, together with significant public investments in rural education, agricultural research, extension, irrigation, and other forms of infrastructure. The application of modern agricultural technologies has led to a spectacular takeoff in crop yields, leading to the production of an additional 100 million tons of cereals annually by 1990 (Fan, Zhang, and Zhang 2002). These changes made agriculture and the rural sector the country's engine of economic growth.

assistance (especially for agriculture and nutrition) and to reform agricultural and trade policies.

Stronger political action to end hunger will require bold leadership, energetic and well organized political advocacy, and clearly articulated public demand. A combination of these elements is essential to mobilize systematic planning, assure the long-term commitment of adequate financial resources, improve institutions and policies, and develop innovative programming.

While numerous global events threaten to distract or derail hunger reduction efforts, there are positive trends as well. The spread of democracy, the growing recognition of food as a human right, and the increasing support for antihunger advocacy groups and political leaders are helping to build the

Box 4.2
India's strategy
for eliminating
endemic hunger

Source: M.S. Swaminathan
 2004.

Despite impressive gains in food production in recent decades, India is the home of a large number of chronically undernourished children, women, and men. A recent analysis of the reasons for food insecurity in rural and urban India identified inadequate purchasing power as the primary cause of under and malnutrition. This can be attributed to inadequate employment and livelihood opportunities arising from high population pressures on land and the slow growth rates of nonfarm employment opportunities.

Based on substantial grain reserves, the Government of India operates a wide range of nutrition safety-net programs. These include the world's largest integrated child development service and a national school meal program. The government recently established an Employment Guarantee Scheme, which provides 25 percent of wages in cash and the rest in wheat or rice (5 kilograms per day). Despite these social support programs, the incidence of both endemic and hidden hunger remains high. To meet the national goal of significantly reducing hunger by August 15, 2007, a National Food Security Summit, held in New Delhi in February 2004, proposed the following seven-point action plan:

- Develop integrated life-cycle nutrition programs and increase programs targeting adolescent girls, pregnant women, and children from ages 0–2.
- Expand the use of community grain banks based on local grains (millets, pulses, and so on) to improve food security at the local level.
- Establish a food guarantee program combining the principles of employment guarantee and food-for-work programs. Engender the food-for-work program to expand women's employment opportunities.
- Sustain, strengthen, and spread self-help groups by ensuring backward linkages with technology and credit and forward linkages with markets.
- Enhance the productivity of cropping and farming systems through packages of technology, services, and public policies.
- Promote a food-based approach to nutrition security through widespread cultivation and consumption of vegetables, fruits, millets, legumes, and tubers and by strengthening integrated production systems of crops, livestock, and fish.
- Ensure access to clean drinking water, environmental hygiene, primary health care, and elementary education.

These steps will help eradicate the image of India as a country with mountains of grain and millions of hungry people.

**Special
attention
must be
paid to good
governance**

momentum to achieve the hunger Goal. For example, hunger-affected communities and local groups are doing more in hunger reduction campaigns and calling for political action to raise the profile of hunger and malnutrition on the political agenda.

At the local level, grassroots groups in Africa have used the poverty reduction strategy process to challenge corruption, strengthen democracy, and improve health and education services directed to the poor and hungry. At the international level, an FAO-supported Intergovernmental Working Group, established at the World Food Summit, developed voluntary guidelines for nations on achieving the right to adequate food, adopted by the FAO Committee on World Food Security in September 2004 and the FAO Council in November 2004. The International Alliance Against Hunger, established at the 2002 World Food Summit, linked governments, international organizations, and civil society in a promising example of antihunger coalitions across borders and sectors (box 4.3). Globally, there is growing recognition of how North American, Japanese, and European farm subsidies impede development—and there is greater willingness to argue forcefully for change (Beckmann and Byers 2004).

At the country level, special attention must be paid to good governance, as a key ingredient to fight hunger and promote economic development. Corruption, excessive bureaucracy, inadequate planning and control, and insufficient institutional capacity hold back the successful implementation of even the best conceived policies. In addition, conflict remains one of the key factors blocking development and hunger alleviation. The primary responsibility for avoiding and resolving conflict lies with national political leaders. But the international community can also contribute to the prevention and resolution of conflicts.

**Box 4.3
The International
Alliance Against
Hunger**

Source: FAO 2001b.

The International Alliance Against Hunger is the title of the final declaration of the *World Food Summit: Five Years Later*. The Alliance provides a forum for advocacy, promotes joint actions by its members, and facilitates information exchange through Web sites, newsletters, and progress reports, bringing together the strengths of different groups into a joint effort. The Alliance includes food producers and consumers, international organizations, academics, donors, policymakers, religious groups, and nongovernmental organizations—all raising awareness about hunger.

National alliances against hunger are the heart of the overall effort, because the main responsibility for reaching development goals lies with a nation and its people. Each country sets its national targets through its legislative bodies and lays out the steps to move forward, including implementing programs that target the hungry. It works in close collaboration with the Rome-based agencies (the Food and Agriculture Organization, the International Fund for Agricultural Development, the International Plant Genetic Resources Institute, and the World Food Programme), nongovernmental organizations, civil society organizations, and the UN System Network on Rural Development and Food Security.

National governments need to be held accountable to fund and implement scaled-up programs to address hunger

The international community should support efforts by developing country governments to establish effective governance and increase accountability at political and official levels. The African Peer Review Mechanism of the New Partnership for African Development is a valuable tool for supporting such efforts and should be more widely used. Yet the challenge remains whether and how to support development efforts in countries with poor governance. The task force suggests maintaining some level of engagement, both for humanitarian reasons and as an investment in the promotion of political, economic, and social change over a longer time frame. Donor investments can also help strengthen legal, financial, and auditing systems to improve governance.

The key message for political leaders is that halving world hunger is well within our means. What has been lacking is sufficient action to implement and scale up known solutions. In July 2004 UN Secretary-General Kofi Annan sent out such a message to the political leaders of Africa. At a meeting in Addis Ababa, he called for a “uniquely African Green Revolution in the twenty-first century” (box 4.4). His vision was of a new kind of revolution with a wider focus on social and environmental sustainability, aimed at simultaneously addressing the biophysical, socioeconomic, and political causes of hunger. “Hunger is a complex crisis,” he said. “To solve it we must address the interconnected challenges of agriculture, health, nutrition, adverse and unfair market conditions, weak infrastructure, and environmental degradation. Knowledge is not lacking.” What is lacking, as ever, is the will to turn this knowledge into practice.

“Success will require African governments to commit themselves wholeheartedly to the Millennium Development Goals, by developing national strategies consistent with the timeline and targets for 2015. We will also need more convincing action from the developed countries to support those strategies: by phasing out harmful trade practices, by providing technical assistance, and by increasing both the volume of aid to levels consistent with the Goals.”

Advocate political action to meet intergovernmental agreements

Political leaders have repeatedly committed themselves to ending hunger, only to fail to act on their commitments. National governments need to be held accountable to fund and implement national scaled-up programs to address hunger. Establishing measurable indicators of progress, and reporting them publicly, can help strengthen accountability.

Several upcoming events will provide opportunities to reaffirm and act on existing commitments. For example, March 2005 will see publication of the report of the U.K.’s Commission on Africa, July 2005 the G8 Summit,¹ hosted by the United Kingdom and focusing specifically on development, and September 2005 the high-level UN event to assess progress on the Millennium Declaration. Hunger will be given high profile at these events. The Task Force on Hunger encourages individual governments to champion the issue

Box 4.4
Toward a Twenty-first Century African Green Revolution

Source: Sanchez 2004.

The original Green Revolution is one of the crowning development achievements for the latter third of the twentieth century. In the developing countries where the revolution occurred, food production tripled between 1965 and 2000, the number of rural poor fell by half, the proportion of malnourished people dropped from 30 to 18 percent, and the real prices of the main cereal crops declined by 76 percent. Determined scientists and policymakers identified the key entry points: the need for high-yielding varieties of rice and wheat—and the crop management practices that would allow these varieties to express their full potential. Other factors were also put in place, such as enabling government policies, new or expanded irrigation schemes, mechanization, seed production, better infrastructure, and stronger national research systems.

While the Green Revolution generated remarkable success in parts of Latin America and Asia, it had little success in Africa. The contribution of improved crop varieties to yield increases were 70–90 percent in Asia, Latin America, and the Middle East, but only 28 percent in Sub-Saharan Africa. There are two major biophysical constraints in Africa: low and declining soil fertility, and scarce or uncertain water supply. The lack of infrastructure, such as rural roads, is also a major constraint to increased productivity. Greater investments to overcome these constraints are essential if Africa is to experience its own Green Revolution.

Many valuable lessons have been learned from the first Green Revolution. It focused too much on monocultures and grain crops, reducing agro-biodiversity. It neglected some environmental concerns, such as water pollution in areas of intensive, high-input-based production. This has led to the recognition that a new, more equitable and sustainable Green Revolution is needed. It should integrate landless, small-scale farm households and community participation in research for the effective design and delivery of new technology suited to local conditions. The focus must be on the poorest of rural households, which generally involve women farmers, who were largely bypassed in the original Green Revolution. Closing the gap between scientists' priorities and those of food-insecure farmers, especially women, is essential for a more equitable and sustainable Green Revolution.

To accomplish this, a new science is emerging, based on better natural resource management and on genetic improvement. We know more about the crucial need to diversify farm enterprises, to work with communities to determine their specific needs, and to preserve the agro-ecosystems and the ecosystems that agriculture interacts with. New technologies must match the realities experienced by the majority of poor producers in nonirrigated, environmentally fragile areas. There is now much greater emphasis on creating a policy environment conducive to innovation on small farms, and a greater focus on gender issues, as well as the need to make markets work for poor producers. With agriculture once again seen as an engine of economic growth, the political will can be rekindled to succeed where past efforts have failed.

during preparations for these meetings. In addition, regional meetings organized around specific Goals could provide a valuable forum for policymakers to exchange information and collaborate in turning commitment into action.

The eighth Goal calls for a “Global Partnership for Development”—reciprocal undertakings that both developed and developing countries must act on if they are to meet the Goals. In accord with the Millennium Declaration,

Reforms in public policy, national priorities, and budgeting are key political actions

the Task Force on Hunger recommends that developed country governments increase and improve their official development assistance, especially for agriculture and nutrition, and reform their agricultural and trade policies.

The initial focus should be on accountability for implementing the 1996 and 2002 World Food Summit commitments, and satisfactory completion of the Doha Development Round—both of which are crucial for achieving the hunger Goal. A key part of the negotiations under the Doha Round relate to agricultural trade and support policies, which should be reformed on terms favorable to developing country agriculture. The OECD policies that require major reform include reductions in domestic production supports, trade-distorting price guarantees, export subsidies, and tariffs and quotas on imports (particularly higher value products from the developing world). Trade negotiations have spurred the formation of new alliances among developing countries, as well as advocacy by international NGO networks. These alliances and networks should continue and intensify their work.

The impacts of trade liberalization will vary among countries and sub-groups. In the long term, the extent of trade liberalization benefits captured by developing countries will depend on the competitiveness and comparative advantage of their agricultural sectors. In the short term, many of the poorest farmers will not be sufficiently integrated into the global economy to enable them to gain much from trade policy reform. For them, the development of domestic and regional markets offers the greatest potential for near-term benefit.

Developing country governments must, in turn, improve the quality and increase the scale of their national hunger reduction programs, targeting hot-spots where the majority of the hungry live. There are many examples of governments in the developing world that have already acted effectively to reduce hunger and malnutrition. Key ingredients of success have included establishing and maintaining domestic peace, applying the rule of law, and making public investments in rural infrastructure and agricultural research to increase farm productivity and reduce rural poverty (Paarlberg 2002).

Reforms in public policy, national priorities, and budgeting are key political actions to be taken by developing country governments. The next chapter discusses these reforms in more detail. Undertaking effective policy reform will involve addressing the needs of vulnerable groups, including women, tribal people, and those living in marginal areas. Because these groups are largely disempowered in national political processes, prioritizing their needs will require the political courage to reverse the status quo.

Success in hunger-related programs can be greatest when governments work in partnership with NGOs and local communities to build support and bring about change. President Luiz Inacio Lula da Silva's commitment to ending hunger in Brazil is an example of effective political action and popular support for hunger eradication (box 4.5).

Box 4.5
Brazil's Zero
Hunger Program

Source: Brazil 2002.

The government of Brazil has developed and accorded high priority to an integrated and comprehensive strategy for reducing hunger, the “Zero Hunger Program.” The program’s strategy is to link five key actions:

- Providing opportunities to excluded people through employment and agrarian reform.
- Using the government’s increased commitment to hungry people to broaden awareness and political commitment within Brazilian society. The program has mobilized civil society and private sector participants, supported by the central government.
- Increasing the basic food supply through support to family agriculture.
- Lowering the cost of food through popular restaurants, agreements with supermarket chains, alternative trade channels, equipment modernization, and reduced taxes.
- Providing emergency interventions, such as food coupons, a basic food basket, free school food, food banks, food security stocks, and mother-child nutrition programs.

Strengthen the contributions of donor countries and national governments to activities that combat hunger

To achieve the hunger Goal, donor countries and national governments must increase their commitment of resources to hunger reduction initiatives. One method of assessing political commitment is to compare national spending on agriculture and rural development with that on other national priorities, such as defense (tables 4.1 and 4.2). Highly food-insecure countries spend two to three times as much on defense as on agriculture.

The already low levels of public investment in agriculture have declined still further over the past decade (table 4.2). On average, developing countries now invest just 0.6 percent of their agricultural GDP in public agricultural research, compared with 2.6 percent for developed countries. The average annual growth of public agricultural research expenditures in developing countries in the first half of the 1990s was significantly below that of the late 1970s, and in Sub-Saharan Africa it was lower than in 1970.

In countries where 20–35 percent of the population is undernourished, agricultural spending averaged 7.6 percent of total budgets in 1992 and only 5.2 percent in 1998. In countries with more than 35 percent of the population food-insecure, agricultural spending in 1992 was 6.8 percent of total budgets, falling to a mere 4.9 percent in 1996. These levels of spending are far lower than the share of agriculture in these countries’ GDP. By contrast, in countries with less than 2.5 percent of the population undernourished, the share of government spending on agriculture comes closest to matching agriculture’s importance in the economy (FAO 2002b).

Compounding this problem, development assistance for agriculture has declined in real terms from the early 1980s to the early 1990s (FAO 2003). From 1993 to 2000, external assistance to agriculture fluctuated around levels

Table 4.1	Region	1992	2001
Share of defense spending in government budgets <i>Percent</i>	Latin America and Caribbean	6.2	6.9
	Middle East and North Africa
	Sub-Saharan Africa	8.4	..
	East Asia and Pacific	23.7	16.4
	South Asia	16.8	14.7
	Europe and Central Asia	15.2	9.6

Source: World Bank 2003.

Table 4.2	Region	1992	1998
Share of agriculture in total government spending <i>Percent</i>	Latin America and Caribbean	3.9	1.9
	Middle East and North Africa	3.7	1.1
	Sub-Saharan Africa	6.6	3.9
	East and Southeast Asia	5.9	5.2
	South Asia	10.4	5.4

Source: FAO 2001a.

close to half those recorded over 1982–86. The World Bank, for example, reduced its lending for agriculture from nearly \$6 billion in 1986 to \$2.7 billion in 1996.

There are many reasons for the decline. These include the inherent complexity, risk, and high transaction costs of agricultural projects; the growing number of environmental and social safeguards that must be built into projects; the perceived ineffectiveness of past projects; the lack of professional capacity in organizations responsible for implementation; and the reduced demand from the developing countries themselves (FAO 2001b). Moreover, low agricultural commodity prices have created a less attractive climate for investment and led to lower rates of return. National governments often have a very low capacity to manage donor-funded projects, particularly when their investment in rural infrastructure and support services to small farms has been neglected (Goodland and Cleaver 2002).

Given the close connection between agriculture and the livelihoods of poor rural people, the combination of declining investments in agriculture and rising military expenditures is extremely worrying—and an indicator of the real priorities of governments and donor agencies, despite their stated commitments. To reach the hunger Goal, official development assistance and commitments from developing country governments for hunger-related sectors must be significantly increased.

The task force recommends that governments implement the existing agreements, such as the Monterrey Consensus, which reaffirmed the minimum target of 0.7 percent of GDP for development assistance, as well as the Marrakesh Agreement under the Doha Development Round. Agreements such as the Maputo Declaration, which committed greater support specifically toward

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hunger and food security, should also be implemented. The task force also recommends that donors increase assistance to sectors related directly to hunger reduction, such as agriculture, nutrition, water, sanitation, and agriculture-related markets.

To secure increased aid and ensure that it is effective, developing countries will need to present sound and actionable hunger reduction programs and policies. Both aid and recipient programs must be well targeted and transparently managed. Both donors and governments should hold themselves accountable for the efficacy of their programs, as measured by outcomes in hunger reduction.

Improve public awareness of hunger issues and strengthen advocacy organizations

Building public awareness of hunger and the issues that surround it can provide political leaders with the mandate and support they need to take action. Antihunger coalitions can articulate arguments for action that are both morally and practically compelling. Civil society organizations can work together to create global awareness campaigns both at the national and international level. In this way they can greatly strengthen the public demand for action. Mass public awareness campaigns are needed to build public understanding of the dimensions, causes, and consequences of hunger. Campaigns should also emphasize that eliminating hunger is feasible. Presenting credible data, actionable solutions, and compelling success stories will strengthen the case.

To build broad public support it is necessary to create a groundswell of popular opinion at the local level. In developing countries this can and should involve mechanisms that enable the poor and hungry to participate in the dialogue. Effectively organized campaigns should involve the participation of all stakeholders, including citizens, NGOs, research organizations, and the mass media. Opinion leaders such as businessmen and women, religious leaders, and public personalities can serve as effective spokespeople for communicating key messages.

For example, the U.S. Alliance to End Hunger brings together diverse institutions working to strengthen the political will to end hunger in the United States and worldwide. It includes advocacy organizations, charities, religious bodies, foundations, think tanks, universities, the private sector, unions, civil rights organizations, farm organizations, and individuals. In Europe, Euro-aid, an advocacy coalition of 38 major NGOs involved in food aid and security, has been instrumental in generating political commitment in the EU for hunger reduction. It has initiated improvements in European food aid and lobbied vigorously for measures to improve food security in the worst affected countries (boxes 4.6 and 4.7).

A key mechanism for ensuring that broad political commitments lead to long-term action is to develop partnerships both vertically (from community to national and international levels) and horizontally (across sectors). For

Box 4.6
Building a global
campaign—
lessons from
Jubilee 2000

Source: FAO 2002b.

Jubilee 2000 Campaign, an international coalition of NGOs and civil society organizations created in the early 1980s, successfully lobbied OECD countries to relieve the debt of highly indebted poor countries (see www.jubilee2000uk.org). Although much more needs to be done, the lessons from the campaign's experience are that campaigns should:

- Outline clear, simple, time-bound goals and restate them relentlessly.
- Have tight, symbolic deadlines.
- Appeal to a shared sense of justice.
- Build coalitions of highly networked civil society groups.
- Maximize the use of both modern and traditional communications technology to mobilize public support.
- Ensure high-quality research and monitoring.
- Target key leaders and secure assurance of their support.
- Focus energy on decisionmaking events and the accountability of individual leaders.

Box 4.7
Campaigning can
be cost-effective

Source: Beckmann 2004.

In the United States the impetus for policies to help reduce hunger domestically and internationally has often come from concerned citizens and grassroots communities. Bread for the World, a nationwide grassroots movement, mobilizes about 250,000 letters to the U.S. Congress each year on issues important to hungry people. In almost every year of its 30-year history, it has helped bring about significant changes in U.S. policy, such as support for debt relief for the world's poorest countries and, in 2004, a 33 percent increase in poverty-focused official development assistance. According to Bread for the World, every dollar it spends on advocacy brings in \$100 of public funding for antihunger programs.

example, the United Nations World Food Programme works with more than 1,100 NGOs to complement its food aid with technical and nonfood inputs. These partnerships draw on grassroots networks, local knowledge, and a wealth of field-based experiences. Partnerships at the local level are also essential for stimulating the urgent action in the countries where needs are greatest. Local NGOs, such as REST in northern Ethiopia, have developed strong relationships with community groups and state organizations that have a common interest in overcoming food insecurity and malnutrition.

Strengthen developing country advocacy organizations that deal with poverty reduction and hunger in poor countries

Strengthening public advocacy is also critical in developing countries, where local NGOs have few resources but can lobby for political action to reduce hunger. Democracy and transparency are needed to create the political space for NGO lobbying and to ensure successful working partnerships with governments. Local NGOs can act as facilitators to assist food-insecure groups to articulate and voice their concerns to government. Greater financial support is needed for such antihunger efforts as the International Alliance Against Hunger. Charitable foundations and private corporations can donate both

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public
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financial support and other inputs, such as technologies, to public sector and civil society antihunger efforts as part of their corporate philanthropy and social responsibility strategies. The strengthening and networking of local community and advocacy groups over the past decade is one of the most promising developments in the struggle against hunger. It shows how effective action can emerge from a system of governance that connects the needs of the malnourished to a local government that is empowered with the necessary technical and institutional capacity (Garrett 2000).

However, those most concerned with hunger reduction—the hungry—are usually disenfranchised and marginalized, not only by their age, gender, and ethnicity but also by their all-consuming struggle for survival. Poverty, illiteracy, ill health, limited infrastructure, and social factors limit hungry people's access to information—and thus their ability to participate in political processes. Effectively addressing this problem requires a thorough understanding of the factors that limit the political power of vulnerable groups and of the strategies that can build support for these groups in the broader community.

Governments wishing to strengthen collective action by and for the hungry should first identify and deal with any factors that prevent the food-insecure from working together. Guaranteeing control over resources or programs for food-insecure communities or individuals can provide a tremendous stimulus to collective action. But care should be taken not to exclude vulnerable groups, such as women or ethnic minorities (Meinzen-Dick and di Gregorio 2004).

Although it is often difficult for disadvantaged groups to gain political influence, current policy instruments, such as poverty reduction strategies, can provide a mechanism for organized groups to acquire a stronger voice (Meinzen-Dick and di Gregorio 2004). But tapping into this potential requires specialized knowledge of how such systems operate (Krishna 2002). The Task Force on Hunger recommends that, in addition to increased financial support for community-based advocacy groups, capacity building and training should be expanded to ensure their participation in national policymaking.

Strengthen accurate data collection, monitoring, and evaluation

Key ingredients in working toward the Goals are accurate data collection and benchmarks for monitoring and evaluating. Such benchmarks, when clear and credible, can serve as a powerful tool for building public awareness and political accountability. At the international level, one mechanism for ensuring accountability and monitoring progress is the United Nations Development Programme's *Human Development Report*, which tracks annual shifts in the human development index by country. A number of UN system organizations—such as the FAO, WHO, United Nations Educational, Scientific and Cultural Organization, the United Nations Children's Fund, the Joint United Nations Programme on HIV/AIDS, and the World Bank—are already monitoring country progress in achieving the Goals. The UN Department of Economic and Social

Developing relevant and robust monitoring and evaluation processes is challenging

Affairs compiles a composite report, inserting the data into the annual report of the UN Secretary-General on the Millennium Declaration's implementation. Even so, improvements in measuring, analyzing, and reporting on country progress are important to attaining the goals and must continue.

It is also important that global and national monitoring and evaluation systems are reflected in local efforts to monitor progress toward the Millennium Development Goals. The task force recommends that key indicators for each Goal and a composite index should be used to measure a country's overall progress toward achieving the Millennium Development Goals. National governments, multilateral organizations, and civil society should work together to strengthen such monitoring and accountability systems.

Developing relevant and robust monitoring and evaluation processes focused on specific Goals is challenging. Particularly difficult is building agreement on sound, uniform methodology, monitoring data collection and analysis, and conveying findings to the public and to policymakers. But efforts show how it can be done. For example, Alliance 2015, a consortium of six major European NGOs, has published an assessment of the EU's contribution to the Goals, with special emphasis on Goal 6 for combating HIV/AIDS, malaria, and other diseases. Monitoring and reporting systems also need to be developed at the national and local levels. All these activities should be built into national strategies for achieving the hunger Goal.

Advocate political action to meet intergovernmental agreements

Actions needed to implement recommendation one

Advocate action through international and regional agreements such as the African Union, the New Partnership for African Development, the Association of Southeast Asian Nations, the Caribbean Community and Common Market, and others. Organize regional meetings around specific Goals to strengthen and focus efforts. Establish measurable indicators of progress, and report them publicly. Ensure that the Goals and progress reports are brought to the attention of key government officials. Milestones for success would be the references to hunger reduction and commitments of budget support stated in international declarations, and progress reports on those commitments.

Strengthen the contribution of donor countries and national governments to activities that combat hunger

Implement development finance declarations, including the Monterrey Consensus, specifically the target of committing 0.7 percent of GDP for development assistance, and the Marrakesh Agreement under the Doha Development Round. Implement agreements on hunger and food security, such as the Maputo Declaration and others. Increase official development assistance for sectors related directly to hunger reduction, such as agriculture, nutrition, water, sanitation, and agriculture-related markets.

Key ingredients for success include donors creating credible and actionable antihunger programs and policies, developing countries assigning priority to hunger reduction in national policies, and both groups practicing cooperation, transparency, and accountability in these actions. Milestones for success include attaining goals outlined in national and multilateral declarations and commitments.

Improve global public awareness of hunger issues and strengthen advocacy organizations

Create mass public awareness campaigns to build public understanding of the dimensions, causes, and consequences of hunger. Campaigns should emphasize that eliminating hunger is within our reach and should present sound data, credible and actionable solutions, and compelling success stories.

Strengthen campaigns by building the capacity of advocacy groups, increasing funding, and providing access to information. Encourage collaboration and partnerships, building transparency and trust between advocacy groups and partners. Involve mass media, particularly television and the Internet. Campaigns should involve all stakeholders including government, the private sector, NGOs, civil society organizations, and international agencies.

Strengthen developing country advocacy organizations that deal with hunger reduction and poverty alleviation

Strengthen collective action by and for the hungry, and expand the participation of developing country civil society institutions in national policy-making to ensure that hunger is addressed. Governments must create the political space for vulnerable groups to voice their demands and for NGOs and civil society organizations to push for policies that reduce hunger.

Governments and international partners can support civil society groups by increasing funding, building capacity through training, and expanding partnerships and linkages with other groups. Key groups include civil and religious organizations, national organizations, NGOs, farmer associations, and national governments.

Strengthen accurate data collection and monitoring and evaluation

Devise benchmarks to monitor and evaluate progress toward reaching the hunger Goal. Strengthen monitoring efforts by UN agencies and the Committee on World Food Security. Fund and empower multistakeholder independent bodies to undertake data collection and monitoring at local and regional levels, as part of national strategies to achieve the hunger Goal. Convey findings clearly to the public and policymakers.

Recommendation two

Reform policies and create an enabling environment

In the fight against hunger and poverty, general and sectoral policies can be powerful and constructive instruments that affect all dimensions of food security. For example, monetary, fiscal, and trade policies have a direct influence not only on the price of food, but also the stability of the economic system and the overall investment and employment climate. In addition, favorable social and gender-specific policies can influence the extent to which the poor and the vulnerable, especially mothers and children, have access to food. But policies poorly formulated or implemented at any level of government can directly impede progress and create conditions that keep the poor trapped in hunger. A favorable policy framework is thus needed to maximize the impact of increased political action and implementing the local interventions described in the next chapters.

To create an enabling environment to end hunger, governments need to implement laws and policies at all levels, national to local, that are conducive to hunger and poverty alleviation. That environment is essential to attracting private investment in agriculture and rural development and to promoting growth, employment, and poverty reduction. It should also ensure an inclusive and participatory policy process—from design to implementation—that truly empowers all stakeholders. National policies, which may be necessary to ensure macroeconomic stability, may have negative effects on hunger and poverty and should be addressed through countermeasures to assist the poor. The process of policymaking should ensure, as much as possible, inclusiveness and participation by all stakeholders.

Governments should monitor the implementation of policies and programs and be held accountable for their impact. The quality and transparency of public administration, a participatory approach to policy designs and implementation, and a commitment to gender equality are essential elements of a

**National
policymakers
need to
recognize
the multiple
drivers of
food and
nutritional
insecurity**

pro-poor and environmentally friendly policy framework. The Task Force on Hunger proposes the following 10 interventions under this recommendation:

1. Promote an integrated policy approach to hunger reduction.
2. Restore the budgetary priority of the agricultural and rural sectors.
3. Build developing country capacity to achieve the hunger Goal.
4. Link nutritional and agricultural interventions.
5. Increase poor people's access to productive resources.
6. Empower women and girls.
7. Strengthen agricultural and nutrition research.
8. Remove internal and regional barriers to agricultural trade.
9. Increase the effectiveness of donor agencies' hunger-related programming.
10. Create vibrant partnerships to ensure effective policy implementation.

Background

In most developing countries the government is the supplier of essential public goods and services including legislation and regulation governing the generation and distribution of national wealth and income. The persistence of hunger can often be attributed to shortcomings in national policies and governance. Good governance—which includes the rule of law, transparency, lack of corruption, conflict prevention and resolution, sound public administration, and respect and protection for human rights—is therefore of critical importance in ensuring sustainable food security (Pinstrup-Andersen 2001).

Although governments bear the primary responsibility for addressing food insecurity and malnutrition, policy formulation should be in partnership with all stakeholders, including civil society and the private sector. Indeed, the broad participation of all stakeholders is essential to the success and sustainability of any hunger reduction program—as well as those designed to attain the other Goals. For example, in formulating national nutrition policies, the contribution of local governments, civil society, healthcare practitioners, educators, and women's groups will all be important.

When policies are poorly formulated or implemented, they can obstruct or harm food security. In many hungry countries, poor legislation and enforcement, cumbersome bureaucracy, and rampant corruption compromise the efficiency and effectiveness of antihunger programs by increasing transaction costs, thus limiting investment, productivity, and employment opportunities. A willingness to re-examine policies, combined with a commitment to change them where necessary, together with the establishment of accountability are keys to combating hunger.

Sustainable hunger reduction policies must be equitable and environmentally sustainable. They must also empower all groups in the society to participate. Pro-poor policies and institutions are needed to improve human capital and expand human potential, broaden access to productive resources and mar-

**National
poverty
reduction
strategies
offer the best
opportunities
for
multisectoral
planning**

kets, and promote the generation and adaptation of knowledge and technology to the benefit of the hungry. Appropriate social safety nets for especially vulnerable segments of the population should be devised and integrated into the policy framework.

To create this conducive policy environment, policymakers need a thorough understanding of the impact of existing policies on hunger through an impact analysis and evaluation. Next, they must identify the key enabling policies to reduce hunger, and assess their probable impact and modes of implementation. Needs assessments should be participatory and inclusive. Then they must formulate policies in an inclusive and participatory manner so that the needs of the poor are fully reflected and the poor are empowered through the process. Once this is accomplished, policymakers must identify and close the financial gap between available country resources and the total budgetary requirement for meeting the hunger Goal by reallocating domestic resources and mobilizing development assistance. These steps are prerequisites for the success of the interventions described below.

Promote an integrated policy approach to hunger reduction

To reduce hunger, national policymakers need to recognize the multiple drivers of food and nutritional insecurity—broadly characterized as a lack of food supply, lack of economic access to food, and poor biological utilization of food. Intervention in only one domain, such as increasing food production by food-insecure producers, is unlikely to be fully effective and will not benefit all vulnerable groups. National food and nutrition policies are needed, featuring coordinated and integrated multisectoral strategies. Strategies to reduce hunger should at a minimum involve agriculture, health, education, social security, transportation, natural resource management, and finance. Gender equality and empowerment should form integral parts of all policies, programs, and interventions.

National poverty reduction strategies and PRSPs, where they exist, offer the best opportunities for multisectoral planning. The task force recommends integrating the Goals into every low-income country's poverty reduction strategy or equivalent national planning process, with a specific focus on what is needed to achieve the hunger Goal. This is especially recommended for low-income countries that are falling behind in their efforts to achieve one or more of the Goals. In middle-income countries with significant pockets of extreme hunger, poverty reduction strategy-type processes will need to focus on ways of targeting populations in greatest need.

Policies to reduce hunger should stimulate increased food production, improve nutrition for vulnerable groups, develop input and output markets, spur the creation of agricultural and off-farm jobs, improve access to clean water and adequate sanitation, strengthen health and education services, and empower women. These policies need to be monitored and evaluated at the

National governments must commit to increase public funding to the sectors essential to overcoming hunger

national and local levels throughout implementation. The focus of all these policies should be on the food-insecure poor. For example, policies to increase food productivity should focus specifically on food-insecure farmers as a first priority, rather than benefiting food-secure farmers already integrated into the market economy. Although the employment opportunities generated by food-secure commercial farmers are a valuable contribution to economic growth, the benefits will not necessarily trickle down to poor and hungry farmers. Hunger must be tackled directly.

Policymakers involved in poverty reduction strategy processes need to recognize that there are wide differences in the nature and causes of food and nutritional insecurity across and within different parts of Africa, Asia, and Latin America—within the subnational levels and between rural and urban areas. As a result, “one-size-fits-all” policy blueprints, even within a country, are rarely appropriate. Policy prescriptions need to be tailored to local needs and resources. For example, India produces abundant food but has large numbers of hungry people—so the top priority of policy reforms should be to increase economic access to food. In many African countries, both food production and purchasing power are low—so policies that increase food production and diversify income-earning opportunities are both important. It is also vital to recognize the common causes of hunger that transcend national borders, such as gender discrimination and the isolation of poor people from markets. On these issues, governments can learn much from success stories in other countries.

Cities and periurban areas have problems that differ markedly from those of rural areas in terms of availability and access to food, market development, natural resources management, and access to basic services. Specific policies are needed to address these problems. For example, despite the existence of urban agriculture in many cities, urban dwellers rely much more on purchased food—so a steady and affordable food supply is essential to their food security. Efficient food marketing systems are the first pillar of urban food security, because they affect the price of food and its quality and safety. As rapid urbanization creates increasing demand for commercial food supplies, policies must be in place to strengthen the infrastructure for distributing food and the systems for ensuring that it reaches the poor and hungry.

Restore the budgetary priority of the agricultural and rural sectors

Creating effective policies and institutions will not be enough. National governments must also make a commitment to increase public funding to the sectors essential to overcoming hunger. This can be done by increasing support for agriculture to at least 10 percent of the national budget—and linking it to additional investments in infrastructure, such as rural trunk roads and feeder roads, railways, ports, health posts, schools, and communications facili-

Nonfarm rural activities form an essential part of the risk management and coping strategies of the rural poor

ties. Kenya and Uganda now invest less than 5 percent of their government budgets in agriculture despite the fact that 70 percent or more of their people are rural and depend primarily on agriculture for their livelihoods. In contrast, Ethiopia, which has a similar proportion of rural people, has recently begun investing 15 percent of its national budget in agriculture. In July 2003, the African Union adopted the Maputo Declaration on Agriculture and Food Security in Africa, endorsing NEPAD's Comprehensive Africa Agricultural Development Programme's recommendation that countries should invest at least 10 percent of their budgets in agriculture and rural development. The Task Force on Hunger recommends that African governments invest at least 10 percent of their budget specifically on agriculture and the public goods needed for agriculture to develop—in addition to the needed investments in rural energy, infrastructure, health, education and other rural sectors.

The increasing recognition of the potential of agriculture and rural development in reducing hunger and poverty is a sign that development assistance providers are ready to respond to such demands. The international community—donor agencies, the UN and other specialized agencies, and international NGOs and private companies—will need to provide significant additional support to hungry countries, in a sustained and predictable manner. Over the long term rich countries should provide budget support and technical advice, remove trade barriers, and accelerate debt cancellation—in addition to restoring investments in agriculture and providing similar increases for other measures to reduce hunger in ways that integrate both gender equality and environmental concerns.

Agriculture alone cannot sustain the livelihoods of poor rural families. Hence nonfarm rural activities form an essential part of the risk management and coping strategies of the rural poor. The aim of rural hunger alleviation policies should be to facilitate the participation of the poor in nonfarm activities and the creation of employment opportunities in the rural areas. Effective policies and institutions are needed to develop rural infrastructure, build entrepreneurial capacity, and ensure competitive and fair markets for small rural enterprises. Increasing the asset base of poor households (liquid assets, education, access to credit) will allow them to participate in more remunerative off-farm employment activities.

Build developing country capacity to achieve the hunger Goal

The perceived lack of absorptive capacity in poor countries is often used to argue against large increases in development assistance. But this impediment can itself become the focus of public investment, with emphasis on enhancing the technical and managerial capacity for policy and program implementation in the sectors relevant to overcoming hunger. Building local capacity should be the central goal of both national government and donor-funded activities. Yet there is a need to develop a better understanding of the underlying causes of

**A corps
of para-
professional
extension
workers could
be created**

the lack of capacity, its symptoms, and its solutions. For example, it is important to determine whether poor performance is due to a lack of technical skills, weak incentives for performance, or political constraints.

It is also important to determine at what level this capacity issue should be addressed and what can be done at which levels. The process of developing a capacity strategy should be fundamentally owned and created by developing countries, with support from donors. Developing countries should be responsible for setting the agenda and leading the process of identifying their needs, through broad consensus and a clear sense of resources and capacity gaps. Capacity development is a long-term process and donors need to support developing countries' agendas with longer term commitments to see sustainable results.

One type of capacity development would be massive on-the-job training of staff in government, NGOs, the private sector, and community-based institutions—in specific interventions to help meet the hunger Goal. In this case, policies should also be implemented to promote local university education in nutrition, agriculture, and business. Such broad training efforts will create the absorptive and implementation capacity for larger investments. A corps of paraprofessional extension workers could be created for agriculture, nutrition, and health, residing in villages identified as hunger hotspots.

Other capacity development efforts might deal more with structural incentives that lead to poor performance. What do countries do when pressures, sanctions, and lack of incentives induce nonproductive behaviors and limit transparency and competition? For example, many poor countries cannot afford an effective public sector. They lack adequate resources for decent salaries—and checks on political abuse. In such a situation, conventional approaches to capacity development, such as restructuring and systemic improvements, will not work. The problem may be related to efficient management systems and the lack of proper monitoring and evaluation systems. The answer may lie in helping countries improve their overall approach to governance, accountability, and democratization.

At the local level, investment in people is crucial to any antihunger campaign. Provided the people concerned remain healthy and actively engaged in relevant work, policies aimed at human capacity development will have highly positive long-term effects. Investments in capacity building at the local level should cover the education, childhood nutrition, and healthcare sectors in addition to agriculture and natural resource management. Across sectors, special attention should be placed on the needs of children and women, with a sharp focus on gender equality. Policies to build capacity should encourage the participation of communities in the planning, implementation, and monitoring of antihunger programs. Decentralization without attention to governance issues will fail if it merely establishes new local elites and does not liberate the skills and talents of ordinary people.

Governments should create institutional structures to integrate agriculture and nutrition policy at all levels

As discussed in chapter 3, national policies that promote basic skills, education, literacy, and numeracy, especially for women and girls, are a key component in capacity building. This requires policy reforms to improve enrollments and educational quality in primary, secondary, and university programs. National policies to ensure universal, high-quality primary education for girls and boys should be established in all developing countries. The Task Force on Education and Gender Equality examines these issues in greater depth.

Link nutritional and agricultural interventions

Nutritional and agricultural interventions are essential to hunger reduction—and could be more effective if designed and implemented in complementary ways. Yet all too often they are undertaken by separate institutions with little coordination between them. The task force recommends that hunger reduction programs increase their efforts to integrate nutritional and agricultural aspects in their work, taking opportunities to try out new ideas whenever possible.

Greater budgetary support is needed for both nutrition and agriculture, especially in remote rural areas and city slums. The structure and priorities of national governments often give inadequate attention to nutritional programs—in ministerial mandates and priorities, and in national poverty reduction strategies. As a result, national food security programs often ignore nutrition, focusing solely on agricultural development. To ensure that hunger and malnutrition are effectively addressed, policymakers must ensure that the two are linked across all hunger-related policies and programs.

Governments should create institutional structures to integrate agriculture and nutrition policy at all levels (from ministries to communities). Cross-sectoral coordination can be encouraged at legislative and executive levels, such as ministries of agriculture, education, and health—and within national food security coalitions. Policymakers can formulate agricultural policies and investments to bring nutritional benefits, and assure that nutritional interventions are fully funded parts of the country's agricultural development strategy. They can also formulate nutritional policies and programs to stimulate agricultural production, through home gardens, school feeding with locally produced foods, and so on. These links can be encouraged in communities by teaching “home science” in primary and secondary school (including nutrition, health, and sustainable livelihoods).

Increase poor people's access to land and other productive resources

Appropriate policies and institutions are needed to facilitate secure access to productive resources, such as land and capital, and to stimulate employment opportunities essential for pro-poor economic growth. Secure access to land is essential for resource-poor farmers to invest in maintaining and enhancing long-term productivity through soil conservation, tree planting, and other

Governments should create and enforce land and inheritance laws that do not discriminate against women

means. The unprecedented increase in agricultural productivity in China, for example, is widely attributed to greater access to land and other natural resources through land reforms and other rural development initiatives—such as improving irrigation and roads, building rural credit cooperatives, establishing technological extension services, investing in health and education, and providing a community-based social security system (Vepa, Anneboina, and Manghnani 2004).

When individual land tenure is not the most appropriate solution, community-based approaches can be effective. Research has shown that many traditional land tenure systems can provide adequate security without introducing costly, contentious, and complex land registration and titling systems. But official registration and titling of land should be considered where traditional land tenure systems do not ensure equitable and efficient use of land resources.

Special efforts are needed to ensure women's access to and control of land. Often, customary laws grant control of land tenure to men, depriving women farmers, many of them heads of households, not just of decisionmaking power but of assets vital to their survival. If a husband dies, his relatives often gain land rights, further dispossessing the widow. When women do own land, their holdings tend to be smaller, less fertile, and more remote than those of men.

Governments should create and enforce land and inheritance laws that do not discriminate against women. Care must be taken to ensure that land reform programs, together with the break-up of communal land holdings, do not lead to the transfer of exclusive land rights to only males as heads of households, as is often the case. This ignores both the existence of female-headed households and the rights of married women to a joint share (FAO 1997). National and local governments should also carry out public education campaigns to promote understanding of the negative impacts of discriminatory land tenure and inheritance practices on women and society.

Over the past 15 years, countries as diverse as Brazil, India, Nepal, The Gambia, and Cameroon have set aside public lands for use or co-management by indigenous and local communities. Legal reforms have strengthened community forest tenure in Bolivia and the Philippines, while China and Viet Nam have allocated public forest land to individual households. The recognition of indigenous rights and community ownership—and the successful cases of management handover now documented—present a good opportunity for more countries to adopt these policies, which seem likely to improve the livelihoods of millions of forest inhabitants. Critical investments will be required to facilitate this transition by supporting the assessment of claims, the mapping of land to be handed over, the delineation of individual properties where appropriate, the reform of legal frameworks, and the establishment of new regulations and enforcement mechanisms (White and Martin 2002).

Land tenure is as important in cities as the countryside. Hungry people who live in slums and have no property rights are permanently excluded from

In Africa the activities most relevant to hunger are the domain of women

the mainstream economy and face far greater economic risk and uncertainty. The Task Force on Improving the Lives of Slum Dwellers covers this topic in greater detail.

Empower women and girls

In Africa the activities most relevant to hunger—farming, preparing food, caring for children, and managing households—are the domain of women. They produce 80 percent of the food and provide 90 percent of the water and fuel consumed by their households. Yet they own only 1 percent of the land, receive only 7 percent of agricultural extension time and resources, and obtain only 10 percent of the credit available to small-scale farmers (FAO 1997). The situation is similar in Latin America and South Asia, where women produce more than half the food (Hayzer 2003).

High rates of malnourishment, illiteracy, early marriage, and inadequate access to reproductive health services create a vicious circle of deprivation that is passed on from mother to child. The low social, economic, and legal status of women is therefore a major barrier to increased food production and improved nutrition at the intrahousehold and community levels. That is why political leaders at all levels should work with community groups to empower women and girls through legal, policy, and institutional reforms. These should be coupled with the targeted provision of healthcare and education, universal access to reproductive health services, and improved access to land, water, credit, and agricultural extension services for women. Policies also need to be put in place to recruit and train more women extension agents, whose advisory services should be linked with women workers in literacy, numeracy, and community health and nutrition programs.

The priorities for mainstreaming gender equality in the pursuit of hunger elimination include:

- Adjust agricultural policies so that they support the needs of women farmers—by improving access to productive resources, increasing the number of women extension agents recruited, and linking women more directly through agricultural advisory services with literacy, numeracy, reproductive health, and nutrition programs.
- Assure women's property rights to land, water, trees, and fisheries by enforcing constitutional rights and increasing access to credit, extension services, and information.
- Inform communities, through public awareness campaigns and school curricula, about behavior and attitudes that harm the nutrition of girls and women—and thus the nutrition of all.
- Ensure that more women play leadership roles in elected bodies and in government programs related to hunger. Key ministries and institutions involved in addressing hunger should increase the number of women professional staff who interact with the public. Governments should

The emphasis should be on rainfed areas—and on helping food-insecure producers

encourage women's participation in social, political, and economic processes and where necessary establish laws requiring equal opportunities and benefits for women and men.

- Encourage the formation of women's self-help groups to initiate community-level actions.
- Adopt the goal of universal access to reproductive health. Both men and women should be educated about the importance of family planning and spacing children as well as the critical need to use condoms to stop the spread of HIV/AIDS and other sexually transmitted infections.
- Review and reform legislation that negatively affects women and their role in combating hunger. In particular, women need to be given access to and control of resources and credit services.
- Adapt education curricula to meet the needs of girls as future farmers, businesswomen, caregivers, and educators.
- Develop and introduce, through agricultural and natural resources research and development, technology that will ease the workload of rural women.

Strengthen agricultural and nutrition research

The unprecedented growth in agricultural productivity in the past century was primarily a result of investments in agricultural research, which can generate new knowledge and technologies to benefit the poor and increase food security (Borlaug 2001). But the belief that most agricultural problems in Africa can be solved by deploying existing technologies has led to a decline in research funding by governments, donors, and international financial institutions since the 1980s.

Public agricultural research systems in most developing countries consist of research institutes and universities that operate independent of extension agencies and farming communities—and are poorly connected to them. The result is inefficient use of national resources, duplication in research agendas, a lack of synergies, research objectives separate from farmer needs, and the limited transfer of research results to poor communities. National science and technology policies should be designed and adequately funded to create effective working partnerships between farmers, universities, research centers, and extension services. This more collaborative and participatory system would replace the outdated linear and top-down approach that has failed in most developing countries.

The Task Force on Hunger endorses the analysis and conclusions of the InterAcademy Council report, "Realizing the Promise and Potential of African Agriculture" (IAC 2004) and the Consultative Group on International Agricultural Research's vision and strategy, "A Food Secure World for All" (CGIAR 2000). The emphasis should be on rainfed areas—and on helping food-insecure producers sustainably increase and stabilize production. For example, there is

**Strategies
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support the
innovation
initiatives of
communities**

evidence from India and China that research and development investments in rainfed areas can result in productivity growth and poverty reduction substantially greater than similar investments in irrigated agriculture (IFPRI 2002b).

The task force recommends increasing national research investments to at least 2 percent of agricultural GDP by 2015. Of this, 1.5 percent should go to agricultural research, as recommended by the InterAcademy Council—embracing sustainable crop, livestock, fish, and tree production systems and associated natural resource and ecosystem management—and 0.5 percent to nutrition research. This would more than double the current funding for such research. These strategies should seek to link with and support the innovation initiatives of communities. The majority of the agricultural and nutrition research funding should address the needs of poor farmers in marginal lands (box 5.1).

The international agricultural research centers coordinated by the CGIAR are grossly underfunded in relation to the huge challenges posed by the expanded agenda they now pursue. Additional funding for these centers should be devoted to the priority interventions identified in this report. Moreover, many of the innovations are not being systematically fed into national rural development plans and processes. This shortcoming needs to be addressed by an explicit, appropriately funded effort to accelerate research and link the work of the centers to national and regional development planning. This initiative will enhance the credibility, relevance, and impact of the CGIAR system.

The task force has also identified the need to strengthen research on human nutrition. Despite recent initiatives on biofortification and a long history of

**Box 5.1
Poor farmers on
marginal lands**

Source: Nelson and others
1997.

Nelson and his colleagues analyzed the distribution of the poor among favored and marginal lands in developing countries. Favored lands are rainfed and irrigated cropland in areas that are fertile and well drained, with even topography and adequate rainfall. These lands are in comparatively intensive use, with low risk of degradation. Marginal agricultural lands are those used for agriculture, grazing, or agroforestry, but often characterized by variable topography, poor fertility, inaccessibility, fragility, and heterogeneity, and at risk of degradation. Forests, woodlands, and arid lands were also included in marginal lands.

The authors approximated rural poverty by applying average national percentages of poverty to the respective areas. The resulting estimates were 325 million poor on favored lands and 630 million poor on marginal agricultural, forested, and arid lands.

An important implication of these findings is that strategies to reduce poverty and hunger will require major investments in marginal lands, even assuming high rates of out-migration from marginal lands to favored lands and urban areas. Given that agricultural production (crops, livestock, fisheries, forests) remains the predominant source of livelihoods and food security in the marginal lands, investments in these sectors—and in maintaining the resource base and ecosystem stability—must play a critical role in poverty and hunger reduction.

Many developing countries and regions would benefit greatly from policy reforms and legislation enabling increased cross-border trade

nutrition policy research, there is a clear need to bring nutritional researchers into the CGIAR research community through interdisciplinary partnerships and strategic alliances. The task force has noted that the links between the agricultural and nutrition research communities are weak and ad hoc. It thus recommends that donors increase funding to the CGIAR from current \$400 million to \$1 billion by 2010—and that the CGIAR centers prepare a plan for scaling up research and capacity building that will support the recommendations in this report.

Remove internal and regional barriers to agricultural trade

For developing countries, trade is an important source of wealth generation and economic growth. It can generate the foreign exchange that countries need to import essential technologies (such as farming equipment or spare parts for manufacturing). These technologies in turn boost the productivity and competitiveness of domestic producers, who may then gain access to larger, wealthier markets abroad (McCulloch, Winters, and Cirera 2001). Greater efficiency of local private sectors also benefits domestic consumers through lower prices and greater choice of goods and services.

Many developing countries and regions would benefit greatly from policy reforms and legislation enabling increased cross-border trade. The share of developing countries' trade with other developing countries is large and growing rapidly. Yet formal and informal trade barriers severely limit the volume and profitability of such trade, blocking potential economic gains. Governments should reform national and regional trade policies to open markets. They should also address the corruption that inhibits cross-border trade flows.

When transporting agricultural inputs and outputs in Africa, traders encounter multiple barriers that drastically increase their transaction costs. These barriers range from legal and casual fees to massive delays at border crossings and checkpoints. Policy and legal reforms are needed, together with adequate training and enforcement to crack down on corruption, and infrastructure investment to improve roads, storage facilities, and border crossings. To make this happen, economic blocs—such as the East African Community, the Common Market of Eastern and Southern Africa, and the Economic Community of West African States—should forge new regional agreements. Regional trading blocks among developing countries are preferable to separately negotiated bilateral arrangements but should not be a hindrance to the progress in multilateral talks on trade liberalization.

International trade regimes are unfairly weighted against developing countries. Farmers in developing countries face high levels of protectionist policies from both developed and developing countries, as well as complex phytosanitary and veterinary regulations. Massive producer subsidies paid by OECD governments to their farmers depress the world prices of commodities,

**Investments
in agriculture,
nutrition, and
humanitarian
food aid
are seldom
well linked**

making imports into developing countries abnormally cheap and creating a strong disincentive for local production.

The domestic agricultural sectors and trade policies of OECD countries are problematic and should be liberalized to open opportunities for developing country production and trade in commodities in their comparative advantage. OECD policies that require major reform include domestic production supports, trade-distorting price guarantees, export subsidies, tariffs and quotas on imports, and protectionist safety and quality regulations.

Unilateral and multilateral trade reforms in agriculture have the potential for considerable poverty alleviation. However, policies must be in place to offset any negative affects that particular groups of poor people may suffer from liberalization (McCulloch, Winters, and Cirera 2001). To increase the trade reform's pro-poor effects, governments must establish complementary policies to ensure that increased agricultural incomes reach the poor, such as through extension services, market and communications infrastructure, training and addressing gender imbalances. The Task Force on Open, Rule-Based Trading Systems addresses this area in greater depth.

Increase the effectiveness of donor agencies' hunger-related programming

Although international donors contribute generously to hunger reduction efforts, their investments in agriculture, nutrition, and humanitarian food aid are seldom well linked. Massive relief efforts to combat humanitarian disasters often dwarf contributions to long-term development. For example, during the 2003 famine in Ethiopia, the United States Agency for International Development (USAID) invested \$500 million in emergency food aid—compared with \$50 million for development programming in agriculture, health, nutrition, water, and sanitation put together (USAID 2003, 2004). The key to preventing or reducing the impact of these humanitarian crises is to better combine the two forms of investment so that they are mutually supportive.

Such imbalances are exacerbated by the basic mechanism of donor intervention. The project cycle is usually short in term (three to five years) and seldom funded to address problems on a national scale. Projects are typically saddled with cumbersome procurement procedures and reporting requirements, taxing the capacity of local governments and other recipients to respond (Goodland and Cleaver 2002). The dispersion of donor projects in a country can be substantial. For example between 2000 and 2002, some 18 aid agencies in rich countries funded no fewer than 1,371 different projects in Tanzania, which also received funding from the World Bank, the IMF, the African Development Bank, and similar regional or international bodies (CGD and Foreign Policy 2004). The impact could be greater with even a modicum of cooperation: using shared coordinating mechanisms, adopting

Box 5.2
Global
partnerships for
rural development

Source: ECOSOC 2004.

To meet the internationally agreed development goals such as those established in the Millennium Declaration, recent sessions of the Economic and Social Council of the United Nations focused on the importance of an integrated UN system approach to rural development. Based on the outcomes of the 2003 high-level meeting on “Promoting an integrated approach to rural development in developing countries for poverty eradication and sustainable development,” the UN Secretary-General issued a report on a coordinated and integrated UN system approach to promote rural development in developing countries. The heads of major UN agencies and ministers of rural development and development cooperation participated in three simultaneous roundtable discussions on:

- Sustainable rural development and natural resources management for poverty eradication.
- Integrated approach on implementation of the Goals in the area of rural development.
- Global partnerships for rural development.

Subsequently, during the council’s 2004 substantive session of June 28–July 23, 2004, a resolution was submitted on a “Coordinated and integrated United Nations system approach to promoting rural development in developing countries, with due consideration to least developed countries, for poverty eradication.” This report referred to the UN System Network on Rural Development and Food Security as a national and international forum that “can assist to exchange and disseminate information, experiences and best practices, reinforce ties between organizations of the United Nations system and other stakeholders and mobilize support for government efforts to implement rural development and food security.”

common monitoring procedures, and developing robust systems for sharing results and knowledge.

Better coordination could result in joint donor support for national food security and rural development by consolidating financial reporting, coordinating procurement, and eliminating tied aid. A good impetus toward a common approach has recently been provided by the OECD peer review system—to assess the performance of member state aid programs.

So far, changes in donor behavior have been slow to materialize. To make a real impact before 2015, new mechanisms will have to be found to bring donors together around agriculture, nutrition, and rural development. Poverty Reduction Strategy Papers, an instrument for donor coordination at the country level, are promoting a welcome shift from project aid to program assistance, largely through direct budgetary support. But this alone may not be a sufficient or suitable vehicle for coordination.

Create vibrant partnerships to ensure effective policy implementation

The international community needs to create and support vibrant partnerships among developing country governments, civil society, the UN system,

and international donors—partnerships that link performance with public accountability and funding for all the Goals.

Such partnerships could form the basis of an independent civil society review mechanism, including participatory monitoring in rural areas. Partners would monitor the activities of bilateral and multilateral donors so that international assistance could be tied to the formulation and implementation of agreed policies. They would also promote awareness in developed countries of the inconsistency between an active international cooperation policy, a closed agricultural trade policy, and debt payment burdens that often exceed aid flows (box 5.2).

Promote an integrated policy approach to hunger reduction

Actions needed to implement recommendation two

Prepare an MDG-based poverty reduction strategy with an integrated, multisectoral approach to meeting the hunger Goal. Poverty reduction strategies should be developed with broad stakeholder participation and include a needs assessment and costing for meeting the hunger Goal, plans to address necessary funding requirements and policy reforms, and systems to monitor and evaluate progress. Align annual budget allocations and MTEFs (medium-term expenditure frameworks for donors) with the MDG-based poverty reduction strategy. Strategies to reduce hunger should involve the health, education, social security, agriculture, transportation, natural resource management, and finance sectors.

Key ingredients for effective policy integration include a focus on the food-insecure and the rural poor, information sharing, and capacity building. Key actors include relevant ministries of the national government, donors, and traditionally underrepresented groups, such as rural government, grassroots leaders, and women. By 2007 all countries should have a poverty reduction strategy or other policy and implementation strategy to achieve the hunger Goal.

Restore budgetary priority to agriculture and the rural sectors

Allocate at least 10 percent of the national budget to agriculture, through national budget processes (involving stakeholder consultation) and donor investments. Substantiate the role of agriculture as the engine of economic growth and development. Link this to increased complementary investments in rural roads, energy, education, healthcare, finance, and communication infrastructure.

Increased budgetary priority for agriculture should be complemented by greater investments in food security and nutrition. A major focus should be expansion of off-farm employment opportunities. By 2007 all African countries should allocate least 5 percent of the national budget to agriculture, with donor support. By 2010 this should reach 10 percent.

Build developing country capacity to achieve the hunger Goal

Invest in education, including community-level literacy and nutrition education; primary and secondary school curricula on nutrition, and university programs on nutrition, agriculture, business, and rural development. Build skills in planning, policy analysis and advocacy, implementation, and monitoring—including the community level. Strengthen basic education and skills at the community level, particularly among women and girls.

Invest in broad-scale on-the-job training of staff at existing institutions. Create a corps of paraprofessional extension workers in agriculture, nutrition and health, based in hunger-intensive areas. Conduct public awareness campaigns on nutrition, agriculture, and gender equality. Ensure independent media and freedom of expression.

Link nutritional and agricultural interventions

Create institutional structures to integrate agriculture and nutrition policy at all levels (from ministries to community levels) and encourage cross-sectoral coordination at legislative and executive levels.

Formulate agricultural policies and investments to bring nutritional benefits, and assure that nutritional interventions are fully funded parts of the country's agricultural development strategy. Formulate nutritional policies and programs to stimulate agricultural production (such as school feeding with locally produced foods and home gardens). Reinstate "home science" primary and secondary school curricula addressing nutrition, health, and sustainable livelihoods.

Increase poor people's access to productive resources

Provide clear ownership of land to all farmers and urban dwellers, with a special focus on securing the land rights of women. Create legislation to establish private land titles, access or rights to community property. Use affirmative legislation to help marginalized people gain property rights or access. Provide innovative tenure arrangements for wise use of shared resources. Ensure that women have the legal right to inherit, retain, and trade property. Ensure effective enforcement of contracts, property laws, and rights to redress, and monitor progress through regular national assessments of land ownership.

Empower women and girls

Empower women as farmers and food producers by assuring their property rights to land, water, trees, and fisheries through enforcement of constitutional rights and increasing their access to credit, extension services, and information. Empower women as caregivers and family nutritional managers by assuring their access to nutrition, hygiene, and healthcare information. Empower women as household income earners by ensuring primary education of all girls, providing numeracy and literacy programs for adult women, and assuring women's access to information on finance and productive assets.

Empower women as decisionmakers and leaders in the household, community, and political arenas by encouraging the formation of women's self-help groups to initiate community-level actions.

Strengthen agricultural and nutrition research

Increase public investments in national research systems to at least 2 percent of agricultural GDP in developing countries. Research should include nutrition, with a focus on marginal lands. Research funding should be increased and diversified to include public, private, and community support. CGIAR donors should increase their investments in the international agricultural research system from \$400 million to \$1 billion a year within five years, assuring the inclusion of nutrition research, and focusing at least half of total funding on addressing the needs of poor farmers on marginal lands.

Research agencies, the private sector, universities, donors, and civil society groups should participate in national priority-setting and implementation, under the overall coordination of the ministry of agriculture. Increase the accountability of research institutions for disseminating their innovations to target communities, and measure results by impact.

Remove internal and regional barriers to agricultural trade

Facilitate the unhindered transport of agricultural inputs and products, within a country and between neighboring countries. This requires policy, legal, and administrative reforms, training and enforcement to reduce corruption, and investment in transport and storage infrastructure. OECD countries should reform policies that reduce access to their markets. The primary actors—national governments working through the World Trade Organization and regional organizations like the Economic Community of West African States, Economic Growth and Agriculture Development, the Common Market of Eastern and Southern Africa, and the Association of Southeast Asian Nations—should make these commitments and take responsibility for their implementation.

Increase the effectiveness of donor agencies' hunger-related programming

Measure donor agency performance based on impact (or progress toward the Millennium Development Goals or other goals), and report it annually to each country where they operate. Donors should enhance complementarity and coordinate their country-level investments to meet the hunger Goal through country-led "basket funding," using the poverty reduction strategy and other planning instruments to set priorities. Donors should also reduce administrative costs. Milestones include a doubling of donor investments by 2015.

***Create vibrant
partnerships
to ensure
effective policy
implementation***

Link public accountability, performance and funding of hunger reduction efforts among developing country governments, civil society, the UN system, and donors. Create a forum of annual meetings to coordinate efforts and monitor progress toward the Goals. Strengthen international networks of stakeholders (including NGOs, the private sector, and international research centers) around the Goals. Key ingredient for success include creating a climate of trust and fora for collaboration between government, NGOs, donor agencies, national governments, civil society, Bretton Woods institutions, the UN system, and donor agencies.

Recommendation three

Increase the agricultural productivity of food-insecure farmers

The world faces a major conundrum: food has never been more abundant, yet 852 million people go hungry. Highly productive agriculture in the developed countries has ensured that the world has plenty of cheap food. This has led some people to question the need to increase the productivity of smallholder farming in developing countries. They argue that the solution to world hunger lies simply in the global redistribution of food from food surplus countries to deficit areas in developing countries.

But the mass transfer of world surpluses to the poor will not solve the problem in the long term. Transportation and distribution costs, along with the cultural values attached to food, would be some of the major constraints. The mass transfer of surpluses could seriously affect local production, reduce income-earning opportunities for the poor, and affect the potential of rural developing economies to prosper. A much more tenable long-term solution to hunger is better distribution of assets and opportunities for improving the productive livelihoods and reducing the vulnerability of poor and food-insecure communities. This would complement growth in commercial agriculture and rural-urban linkages, stimulated by the private sector and trade.

The interventions described here will empower poor farming communities to increase their food production, so that they produce enough for themselves and have a surplus for sale on the market. These interventions are closely linked with those in the preceding chapters to enhance access to markets and strengthen service providers and institutions. A major focus here will be the crop, tree, and livestock systems of resource-poor, food-insecure farmers in marginal lands, mostly in subhumid and semiarid tropical areas, at both low and high elevations, where the bulk of food-insecure smallholders are located. The UN Millennium Project considers raising agricultural productivity as a priority investment area necessary for Africa (UN Millennium Project 2005).

**Raising
agricultural
productivity
is a priority
investment
area for
Africa**

But improving the productivity of agriculture, broadly defined, is an important objective in all countries where there are significant numbers of poor rural people, especially in landlocked countries and remote areas where people have poor access to markets. The Task Force on Hunger recommends five interventions as the most important in increasing agricultural productivity for the food-insecure:

- Improve soil health.
- Improve and expand small-scale water management.
- Improve access to better seeds and other planting materials.
- Diversify on-farm enterprises with high-value products.
- Establish effective agricultural extension services.

Background

Over the past 50 years very few countries have tackled mass poverty and hunger without strong economic growth based on increasing agricultural productivity. Statistics show that undernourishment has fallen where food production has risen, at least at the early stages of growth. Between 1990 and 1999 per capita food production grew by only 0.4 percent a year in countries where the number of undernourished increased significantly. But it grew by 3.8 percent in countries where the number of undernourished decreased significantly (FAO 2001a). Raising agricultural productivity where yields are low has the potential to reduce hunger and poverty by directly increasing access to food for producer households and communities. As the Green Revolution demonstrated in parts of Asia and Latin America, raising productivity also increases the supply of food for nonfarming families (the rural landless and urban), stimulates the local and national economy by creating demand for consumer goods and farming inputs, and creates nonfarm jobs in the rural economy.

Today's glut of food is largely the result of market distortion—of the rich world offering subsidies that create surpluses. The hungry poor are isolated from the markets where this food is available, and have little money to pay for it. Small farming families represent half of the hungry worldwide. These producers are offered no subsidies to support their efforts to grow food (Scherr 2003). They have neither the technology nor the inputs to make their efforts more productive. So they remain hungry. Moreover, their coping strategies often lead to the depletion of natural resources, deepening the poverty trap and losing valuable ecosystem services.

Hunger tends to be concentrated in remote rural areas, often where rainfall is poor or erratic and where soils are susceptible to degradation. People living in these areas have been neglected by policymakers in the mistaken belief that they are few in numbers, that the natural resource base cannot support more intensive use, and that land will inevitably degrade as the population, whether of people or animals, rises.

Tree cover on small farms increased with higher human population density

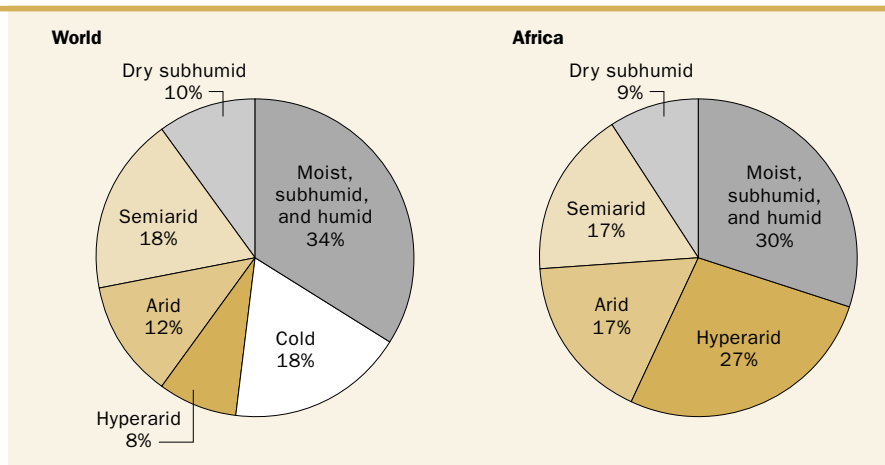
For example, it is commonly believed that increasing production in the drylands will lead to degradation and desertification. But more than 70 empirical studies found that local population growth in hills and mountains of developing countries did not necessarily threaten forest production, agriculture, livestock production, or watershed stability (Templeton and Scherr 1999). Tiffen, Mortimore, and Gichuki (1995) have shown that land degradation can actually decrease as population increases. As population growth raises the value of land and resources, people often change their methods of managing economic plants and animals and make land improvements—individually and collectively—to offset initial declines in productivity and resource quality that result from more intensive use of resources (Templeton and Scherr 1999).

Holmgren, Masakhad, and Sjöholm (1994) also reported a positive correlation between the volume of deliberately planted trees on farm and human population density in 30 districts of Kenya. They found that tree cover on small African farms increased with higher human population density. As long as farmers had secure land tenure, they planted more trees when they no longer had access to nearby forests for tree products. If people have access to markets, they will invest more in their land and increase production and income while conserving the soils they depend on for their future income.

The number of people living in marginal areas is high. The world’s drylands (arid, semiarid, and dry subhumid zones) constitute more than 40 percent of its potentially productive land (UNDP and WRI 1997) (figure 6.1). Best estimates are that between 800 million and 1 billion people depend on the natural resources of these lands (Dobie 2001). For example, 11 percent of the world’s people live in mountainous areas, 40 percent of them food-insecure (Huddleston and others 2003). Some hunger hotspots nevertheless occur in humid and subhumid areas with favorable topography, usually with high rural population densities. Many of these areas are considered high-potential areas, but soil nutrient depletion and erosion have made them no longer favored lands.

Figure 6.1
About two-fifths of the world is arid or semiarid—three-fifths of Africa

Source: UNDP 2004a.



The main development pathway for hungry smallholder farmers is to increase their productivity

Evidence is accumulating that greater returns can now be achieved by investing in marginal lands than in high-potential lands. Results from India and China suggest that government investments in the less favored areas have greater poverty-reducing effects, as well as greater productivity effects, than investments in the better endowed areas. This may reflect past high investment in the more favored areas in these two countries, leaving plenty of neglected investment opportunities in marginal lands.

It has recently been shown that mobile pastoralists living in the drylands have greater economic potential under modern conditions than has long been assumed. Pastoralists are experts at maximizing the benefits from pasture and water resources while minimizing the environmental damage (UNDP 2003). Making development work in more marginal areas will be more challenging than in high-potential areas, but evidence from both developed and developing countries shows that it can be done. To ignore marginal lands would consign millions to poverty and hunger—and abandon vast areas with genuine potential for increased productivity.

The two ways of increasing food production from settled agriculture are to increase the area of land under cultivation and to increase the productivity of land and farm labor. Smallholders have few opportunities to increase the size of their farms, because additional land is not available. Moreover, there are often shortages of labor at peak periods of land preparation, weeding, and harvesting due to a lack of appropriate tools and animal power, the rural exodus of household members to seek income, and the impacts of HIV/AIDS.

The main development pathway for hungry smallholder farmers, then, is to increase their productivity—defined as the yield per hectare per year of crops, livestock, trees, and aquaculture—by intensifying their enterprises. Proven technologies can double or triple yields, even in remote smallholder farms on marginal lands. The most important constraints to achieving yield gains are soils depleted of nutrients, shortages of water, lack of access to improved crop varieties, failure to diversify farm enterprises, poor control of pests and diseases, and extension services that are weak or moribund and divorced from research.

Women produce between 60 and 80 percent of the food in most developing countries and are responsible for half the world's food production (Hayzer 2003). Given women's heavy workload on and off the farm, technologies that ease the burden on women should be made more broadly available. Improved farm implements for poor women farmers, to replace the antiquated hand hoe and machete, will ease labor and improve agricultural processing and productivity. Woodlots and agroforestry techniques can provide firewood closer to the home. Small-scale water harvesting can improve access to water for domestic and agricultural use. In semiarid areas, grass and fodder trees planted in fenced compounds can allow high-value dairy and meat production close to the home and open up numerous sources of income—if markets are accessible. Dissemi-

Many of the food-insecure farmers in the developing world are farming on severely degraded soils

nating these technologies will be facilitated if the number of women extension agents rises. Targeted public policy and investment programs can facilitate all these initiatives.

Improve soil health

Many soils in Asia, Latin America, and especially in tropical parts of Africa have become so degraded that they have greatly reduced productivity. Others, such as those in the Sahel, are inherently infertile. Small-scale farmers over decades have removed large quantities of nutrients from the soils without replacing them with manure or fertilizer in sufficient quantities. This has resulted in a high average annual depletion rate of 22 kilograms of nitrogen, 2.5 kilograms of phosphorus, and 15 kilograms of potassium per hectare of cultivated land over the last 30 years in 37 African countries—an annual loss of nutrients the equivalent of \$4 billion in fertilizers (Sanchez 2002).

Many of the food-insecure farmers in the developing world are farming on severely degraded soils, which lack nutrients and organic matter, have poor structure, and often suffer from unchecked erosion. Nutrient imbalances in the soil and pollution by excess nutrients can create unhealthy soils in previously healthy soils, as is now happening in the cradle of the original Green Revolution. Because of the magnitude of soil degradation, restoring its health is often the first entry point for increasing agricultural productivity in many hunger hotspots. This section examines five major soil health interventions, to be used simultaneously: increasing soil nutrients through the appropriate combination of mineral and organic fertilizers, using green manure to improve soil fertility, planting fertilizer trees on farms, returning crop residues to the soil, and using better methods of soil erosion control and water conservation.

Mineral and organic fertilizers

The soil nutrients needed by crop plants can be provided by either organic inputs or inorganic and mineral fertilizers. In environments with a high production potential that are well integrated into commercial markets, mineral fertilizers, supplemented by organic inputs, are the dominant practice. In marginal or remote areas, internally generated organic sources of nutrients from animal manures and nitrogen-fixing leguminous plant species may be the best-bet technologies, though mineral fertilizers (particularly phosphorus and sometimes potassium) are often needed.

Both mineral and organic technologies can be cost-effective, especially for smallholders who face cash constraints, as long as the soils have not been so extensively degraded that most of the organic content is lost (Omamo 2002). The arguments for or against mineral versus organic fertilizers are often debated in development circles (box 6.1). The Task Force on Hunger believes that the soil fertility debate should focus on economic issues, such as cost and risk, since either mineral or organic nutrients can safely supply needed plant nutrients

Farmers and herders need a basket of options to choose from

when used in appropriate amounts. We recommend the combined use of both, accompanied by other measures needed to restore soil health.

Adaptive, integrated soil fertility, crop, and livestock management research, in collaboration with farmers, is needed to develop options suitable for different agro-ecologies and socioeconomic circumstances at the hotspot level. The ways organic and mineral sources of nutrients can be combined with available water and integrated pest management systems can be identified to produce sustainable increases in agricultural productivity.

Much of this site-specific adaptive research should be carried out with farmers in their fields. It is especially important for farmers and extension workers to understand the basic principles of soil fertility management, rather than simply be given prescriptive solutions. Farmers and herders need a basket of options to choose from. Through farmer field schools and participatory technology development approaches, farmers worldwide have proven capable and motivated to test, compare, and adapt technological options, combining their own knowledge and innovations with modern scientific solutions to suit their specific situations.

The farmer's perception of the risk of crop failure and the cash and other resources available are very important considerations in developing recommendations. While it may be important for farmers to have a sense of what is bio-

Box 6.1
Mineral versus organic fertilizers

Source: Sanchez 2002.

Unlike other agricultural inputs, nutrient inputs are essential in all forms of agriculture. They come mainly from inorganic (mineral) and organic fertilizers. Agronomists know that the plant does not care whether the nitrate, phosphate, or potassium ions it absorbs come from a bag of fertilizer, a piece of manure, or a decomposing leaf. There is nothing wrong with mineral fertilizers when properly used. Correctly applied and ensuring a balanced supply of required nutrients for plant growth, they produce high yield increases and good economic returns.

Organic inputs include livestock manure, compost and biomass transfers from plants outside the field, green manure, cover crops and fertilizer trees. They have a low concentration of plant nutrients, are bulky, and in the case of manures, composts, and biomass transfers are labor-intensive to transport. Derived from plants, organic inputs add all 16 essential elements to the soil, including potassium, calcium, magnesium, and micronutrients. Mineral fertilizers usually add only the three major elements—nitrogen, phosphorus, and potassium (though more recent bulk blended products allow the addition of secondary and micronutrients).

Although the plant doesn't care where its nutrients come from, the soil cares about the level of organic carbon it receives. Organic fertilizers add carbon, which improves the soil's water-holding capacities and the energy source for the microorganisms that enhance nutrient cycling.

Virtually all sustainable crop production systems combine the use of mineral fertilizers with organic inputs. The sole application of nitrogen fertilizers accompanied by total crop residue removal is doomed to fail—and is not recommended.

A major challenge is to find ways of making fertilizer available to smallholders at affordable prices

logically possible on their fields, in most cases yield maximization is unlikely to be the most desirable way to go, given risk and financial considerations. Intermediate solutions will generally be more appropriate. Where the cost of mineral fertilizers is high, as in Africa, it is especially important to focus on achieving maximum efficiency in the use of purchased fertilizers. This entails timely application of inorganic and organic fertilizers in ways that minimize the nutrient losses associated with broadcast surface applications.

While nutrient depletion and erosion are the most pervasive soil productivity problems in food-insecure areas, there are growing sustainability problems in many intensive production systems, such as the irrigated rice-wheat farming system in the Indo-Gangetic plains of South Asia and in irrigated areas of China. Excessive use of cheap, subsidized nitrogen fertilizer has led to a decline in organic matter—and in soil health (box 6.2). Unless these issues are addressed, food security in Asia could be undermined through the decline of food production in intensively farmed areas.

A major challenge facing the development community is to find ways of making fertilizer available to smallholders at affordable prices. Many resource-poor farmers use very little fertilizer, especially in Sub-Saharan Africa. High cost to price ratios (fertilizer to crop yield) and difficulties in getting the right fertilizers when needed are the main reasons. Fertilizers cost from two to four times more at the farmgate in Sub-Saharan Africa than in Europe, North America, or Asia.

The prescriptions for economic adjustment that donors have imposed on Africa have led to the elimination of the subsidies that mineral fertilizers used to enjoy. The significantly higher prices after market liberalization led to the collapse of fertilizer imports into most countries. The result is that the prices of mineral fertilizers are now too high for most small farmers, especially if applied to basic food crops. This is especially true in remote marginal areas, where input costs are even higher and the risk of crop failure greater.

The notion of reintroducing fertilizer subsidies to benefit food-insecure farmers is controversial, since subsidies are costly, have often failed to reach the poorest farmers, and have inhibited private sector development. Moreover, the few small-scale farmers who buy fertilizers often apply them to cash rather than food crops. Even so, the Task Force on Hunger considers that it is vital for food-insecure farmers to use increased quantities of mineral fertilizers combined with organic fertilizers in their struggle to improve food security and restore soil health.

As an emergency, relatively short-term intervention, we believe that targeted subsidy programs should be designed to supply both mineral and organic fertilizer as an investment to improve the status of highly food-insecure farmers. One promising strategy is the use of nontransferable certificates of entitlement or tamper-proof “smart cards” redeemable at private agrodealers,

Box 6.2
Unhealthy soils in
the cradle of the
Green Revolution

Source: Lal and Dawswell
2004.

Irrigated rice and wheat are grown on 23.5 million hectares in India, Pakistan, Bangladesh, Nepal, and China—supporting more than 1 billion people in the Indo-Gangetic plains and other fertile valleys of Asia. This system was the backbone of the original Green Revolution, which saved hundreds of millions of people from starvation. Rice production in South Asia increased from 67 million tons in 1960 to 178 million tons in 2000—wheat production from 15 to 90 million tons.

But yields in the rice-wheat system have reached a plateau, largely because of declining soil health. Farmers apply too much nitrogen fertilizer and too little organic matter and other sources of essential nutrients. Because of high prices, phosphorous and potash fertilizers are not used, and there is a strong nutrient imbalance. The fertilizer response of crops to nitrogen is declining because of the severe deficit of phosphorus and potassium. Micronutrient deficiencies are widespread, precipitating similar deficiencies in people.

Too low a proportion of crop residues is incorporated back into the soil, and topsoil organic matter contents have drastically declined. Farmers remove the wheat stover to feed livestock. Rice straw is burned. The remaining wheat stubble is heavily grazed. Excessive tillage is practiced for weed control. And instead of returning cattle manure to the soil, dung is used as fuel for cooking since there are no trees. Little or no green manure, cover crops, or agroforestry technologies are used.

Nutrient mining is being exacerbated by the use of topsoil for brick making. Landowners in India sell topsoil down to a depth of 1 meter for about \$3,000 a hectare. Crops are then grown in the subsoil, which is essentially devoid of organic matter, has low inherent fertility and yields very little. Another problem affecting soil health is that groundwater levels are rising in areas irrigated by canals. Rising water tables are invariably accompanied by increased salinization. Vast areas of once-productive lands are now barren and encrusted by salts.

The degradation of soil and water resources severely affects human health. Many parts of South Asia that depend on the rice-wheat system are now hunger hotspots. In addition to calorie and protein undernutrition, iron and zinc deficiencies are pervasive, particularly among nursing mothers and infants.

Agricultural productivity in the intensively cultivated irrigated areas of Asia will only be sustained if soil and water resources are restored and maintained. On a promising note, improvements in crop management are now spreading in these high-potential areas, including conservation tillage and planting on raised beds. Conservation tillage is now used on about 1.3 million hectares of irrigated wheat land, where the crop residues left as mulch have begun to rebuild organic matter.

which would support input market development (see chapter 11). Countries that have demonstrated a willingness to improve governance and fight corruption should be assisted in establishing such systems.

The task force also advocates supplying food-insecure farmers with nutrients, whatever their source, at the lowest possible cost. But we also recognize that for high-value crops, organic farming may be an attractive option. Whether certified as organic or not, it may be an alternative as long as sufficient organic material can be produced or accessed. The task force acknowledges that this may be difficult in nutrient-depleted soils.

Green manure and cover crop systems that improve soil fertility are well proven

Phosphorus deficiency exists in parts of East Africa, the Sahel, and some highland regions of Asia and Latin America. While the task force believes that improved systems of agroforestry, and green manure and cover crops can increase the availability of nitrogen for crop production, other essential plant nutrients cannot be supplied in sufficient amounts by organic means (Palm, Myers, and Nandwa 1997). Phosphorus will have to be supplied mainly through mineral fertilizers. But in some areas of Africa, where phosphate rock is abundant and of the right quality, there is scope for developing local rock phosphate industries for direct application. Research has shown that indigenous rock phosphate deposits can provide a cost-effective alternative to imported super-phosphates (Jama, Swinkels, and Buresh 1997).

Green manures and cover crops

Green manure and cover crop systems that improve soil fertility are well proven. More than 145 different systems have been identified and adopted with few or no subsidies needed (Bunch 2001a, b). On poor land, farmers typically achieve grain yields of around one ton per hectare. With appropriate biological systems, this can be raised to three to four tons per hectare within three or four years. Some green manures and cover crops can also produce high-protein food, feed, and medicines. Smallholder farmers around the world currently use some 70 species of green manure and cover crops. Conventional production systems on poor land often require that land be left fallow to restore its fertility. With improved techniques, land can be cultivated every year, and total production can be increased to six or eight times that of the traditional system.

Other technologies that improve soil fertility without fallowing include intercropped green manure, cover crops, mulching, conservation tillage, and zero tillage. These technologies have spread across southern South America over the past decade and are now used by about 2 million farmers, both large and small. Yields of food crops have risen by between 50 and 200 percent, with only moderate added costs. These technologies also greatly reduce erosion, increase soil organic matter content, and reduce the amount of mineral fertilizer needed per unit of yield. Even herbicide use for weed control can be reduced if green manure and cover crops are used.

Fertilizer trees (nitrogen-fixing tree fallows)

Trees on farms provide numerous benefits. One of their most valuable services is to increase the fertility of the soil. Leguminous trees of the genera *Sesbania*, *Tephrosia*, *Crotalaria*, *Glyricidia*, and *Cajanus* can be interplanted into a young maize crop and allowed to grow as fallows during the dry seasons, accumulating 50–100 kilograms of nitrogen per hectare in 6–12 months in subhumid East and Southern Africa (Kwesiga and others 1999). After harvesting the wood from the tree fallows, nitrogen-rich leaves, pods, and green branches

Tree fallows are economically and ecologically sound

are hoed into the soil before planting maize at the start of a subsequent rainy season. This above-ground litter and the tree roots then decompose, releasing further nitrogen and other nutrients to the soil.

Farmers are now establishing tree fallow-crop rotations spontaneously in some parts of Africa. These rotations consist of one year of trees followed by one crop of maize in bimodal rainfall areas of East Africa, or two years of trees followed by two or three maize crops in unimodal rainfall areas of Southern Africa. Tree fallows are economically and ecologically sound. And they fit well with farmers' customs and work calendars, in part because the technology was developed with farmers (Kwesiga and others 1999; Sanchez and Jama 2002). *Glyricidia* can also be considered as a permanent intercrop with cereals, allowed to grow during the dry season and subsequently cut back before the next planting, when the nitrogen-rich pods, foliage, and branches are incorporated into the soil.

Crop residue return

Crop residues (stalks, leaves, husks) are valued for a number of uses. They constitute an important source of feed for animals. They are sometimes used as fuel. And they are even used as building materials. Taking the residues out of the field robs the soil of nutrients and affects the porosity and water-holding capacity of the soil. In principle, good soil management should involve the return of all plant residues, by ploughing them in, leaving them on the surface as mulch, or composting them. In most of the farming systems managed by food-insecure smallholders, a substitute for their other uses would be necessary, especially other sources of animal feed. Grasses, multipurpose trees, and various shrubs are potential substitutes.

In parts of the Sahel nomadic pastoralists have traditionally been granted the right to graze their animals in the fields of settled farmers after harvest. The animals feed on the crop residues, but this does not deplete soil nutrients because their dung falls on the field and is rapidly assimilated into the soil.

The main limitation in using compost is the lack of plant material to make enough compost for use on anything but high-value crops. Composting is also labor-intensive.

Soil and water conservation

Also important for soil health is effective soil and water conservation. Conservation agriculture combines no tillage with the maintenance of a protective vegetation cover, crop rotations, and reduced traffic. The damaging effects to tropical soil structure and soil biological activity through conventional tillage with a plough, or even a hoe, have only recently been well understood. The development and adoption of no tillage practices to overcome erosion and productivity decline has been driven by smallholder farmers largely in South and Central America, covering millions of hectares.

**Many of
the world's
hungriest
farmers are in
the seasonal
subhumid
and semiarid
tropics**

The accelerating adoption process by a wide range of farmer types and situations, and its more recent successful testing and adaptation in many agro-ecological zones, counties and regions, is testimony to its success. Conservation agriculture is a win-win technology in many senses. It restores a healthy functioning soil. It saves labor. It captures rainwater in areas prone to drought. And it has beneficial effects on the wider hydrological regime and nutrient and carbon cycles.

Contour terraces, necessary on sloping lands, can serve several purposes when furnished with grasses and trees. The bunds can grow grasses and leguminous fodder trees for livestock, alleviating the pressure on crop residues. They can also grow timber and fruit trees that do not compete with the crops in the terrace, as well as nutrient-accumulating shrubs like the Mexican sunflower (*Tithonia diversifolia*) for biomass transfers to adjacent crop fields. In totally deforested places, like much of Tigray, Ethiopia, soil conservation structures are being built with stones. Once the soil has stabilized, they can be clothed with grasses and trees. Since much soil erosion in food-insecure regions occurs on communally held land, such as grazing areas, roadsides, and riparian zones, similar practices need to be put in place there.

Many challenges remain in replenishing soil health. Mineral fertilizers are expensive, and farmers who face high risks from drought and fluctuations in market prices will be reluctant to invest in them. There will be little advantage to provide mineral fertilizer in places that lose three of every five crops to drought, unless water management practices described in the next section can reduce this risk. Improved tree fallows have yet to prove their worth in the Sahel, where the much longer dry season limits their growth and their potential to fix nitrogen. Fallows also do not perform well on shallow or poorly drained soils—or in frost-prone areas. The availability of high-reactivity rock phosphate is limited by poor market development, but demand is growing. Many of the rock phosphate deposits in Africa are of low reactivity and have limited potential for direct application.

Despite these limitations, various soil improvement techniques have proved highly effective throughout the developing world. They remain the basis for improving agricultural productivity in food-insecure farming communities.

Improve and expand small-scale water management

Many of the world's hungriest farmers are in the seasonal subhumid and semiarid tropics. While soil health remains an issue in these zones, water availability is critical and in many places even more central. Various techniques of water harvesting and small-scale irrigation, combined with efficient water use, should be used to transform crop and livestock production. Building effective technical backstopping capacity in water harvesting, small-scale irrigation, and efficient water use is critical to achieving impact through scaling up.

**Various forms
of water
harvesting
can be
employed in
drier areas**

Over the next 10 years rainfed agricultural systems are likely to come under more pressure to increase crop and livestock production. Many food-insecure smallholder farmers are unlikely to benefit from increased large-scale irrigation for technical and environmental reasons. Water is expected to become scarcer as farmers compete with domestic users. Climate change may worsen the situation (Rosegrant and others 2002). Many hunger hotspots are in areas of irregular or inadequate rainfall. Improved small-scale water management has more potential to increase yields than any other intervention in such areas.

The first requirement of water harvesting is to replenish soil moisture by increasing the infiltration of rainfall. Water infiltrates best when the topsoil is porous, contains adequate organic matter, and is covered by a layer of live or dead vegetation. Infiltration is reduced when the soil is crusted and compacted by raindrops, animals, or agricultural machinery, particularly when crop residues are removed from the field. Various management practices can improve infiltration by slowing the runoff of rainwater. These include grass bunds, terracing, tied ridges, zai holes, and many other techniques that also have other advantages, notably protecting against soil erosion (Hillel 2004). Maximizing infiltration is vital in semiarid areas, but it may also be necessary to ensure supplementary watering if crop yields are to increase substantially. For grass production, however, good results can be achieved by improving infiltration alone, without supplementary water.

Various forms of water harvesting can be employed in drier areas. All involve intercepting rainwater as it runs off slopes. The water is typically led to microcatchments—where the land has been shaped to hold the water until it penetrates the soil—or to small impoundments (usually behind a dam), or into cisterns for domestic use or for watering livestock. Water can be caught and channeled using techniques ranging from simply clearing slopes to building channels that bring water to pipes. Considerable amounts of water can be retrieved from apparently dry riverbeds using small dams, walls, and pits, even replenishing wells, as the task force members saw in Rajasthan, India.

Large-scale irrigation is unlikely to bring substantial additional benefits to many small-scale farmers over the next decade. Many large-scale irrigation schemes in developing countries have proved to be uneconomic because output markets are weak. Lately, concern has grown over the environmental effects of such schemes and the effects on people who are displaced when they are built. But there is considerable scope for increasing the use of small-scale irrigation. Traditional irrigation methods have involved periodic flooding of the fields—often with water harvested from slopes, which is not very efficient. Newly developed “micro-irrigation” techniques aim to apply just the right amount of water to plant roots (Hillel 2004). The most advanced systems deliver water through flexible plastic pipes, dripping it through tiny nozzles or porous materials.

The main challenges to increasing the use of water management methods are social and managerial, not technical

Other micro-irrigation systems include micro-sprayers (fine jets fanning from small nozzles) and bubblers, where water “bubbles” slowly flow from the top of a vertical tube set in the soil. Where this technology is too expensive to install throughout whole farming communities, human or animal labor can carry the water to where it is needed. These techniques can make land previously unsuited to irrigation irrigable. The water is constantly supplied to the plant roots, and it becomes less important to store the water in the soil. Thus porous sandy and rocky soils can be irrigated. Small-scale irrigation is, however, technically exacting, and considerable skill is needed to ensure the correct growing conditions for the plants. If the supply is interrupted, total crop failure is likely. Farmers often improvise—say, by punching holes in plastic tubing.

In wetter areas, digging drainage ditches and using gates or siphons to control water flow is common. These techniques require little capital and are easily managed. In places with high water tables, hand-dug wells can ensure access to water for either domestic or agricultural use. It is important to recognize that wells tap a common water resource, so local management is needed to ensure that not too many are sunk, while still ensuring the equity of access to water. Wells commonly proliferate where water is scarce, leading quickly to all of them drying up simultaneously. Extracting water from wells for agricultural use is laborious. Animal traction is often used, though the modern preference is to use mechanical pumps. This draws attention to the need for improved rural energy supplies.

The main challenges to increasing the use of small-scale water management methods are social and managerial, not technical. Although individual farmers can apply basic water infiltration techniques, water harvesting and most forms of irrigation require community effort and a willingness to share resources. Efforts to improve water management have often failed because they were driven only by technology. In the future, the emphasis must be placed on developing the social capital needed to ensure effective community action, and on ensuring that people have access to the information they need. Water user associations, with appropriate training and clear roles and responsibilities, have proven to be extremely capable of managing small-scale water resources management systems.

But funding water management has been a particular problem. Centralized governments find it difficult to fund small, scattered investments that have to be locally conceived, designed, built, and managed. The decentralization of planning and funding will be imperative. Communities will often need compensation for the effort they dedicate to communal construction work, and carefully designed food-for-work programs can be instrumental in that regard.

Better small-scale water management can make almost every other operation on a farm more productive and less risky. In some communities in India, for example, a combination of water harvesting and the rehabilitation of

Genetically superior crop, pasture, and tree varieties can increase the productivity of farms

degraded land has boosted farmers' incomes by more than 600 percent (FAO 2002b).

Improve access to better seeds and other planting materials

If soil and water problems are brought under control, the provision of genetically superior crop, pasture, and tree varieties can enormously increase the productivity of farms in food-insecure areas. Indeed, the interaction between improved germplasm and improved soil fertility is very strong. Often, improved varieties are the catalyst for a range of other improvements, yet there is usually no magic in a variety alone. Only for a serious pest or disease problem, such as downy mildew in Southeast Asia, does developing a resistant variety make sense without other innovations.

The high-yielding fertilizer-responsive semi-dwarf wheat and rice varieties of the original Green Revolution—combined with improved soil fertility, water management, markets, and infrastructure—were responsible for rapid and sweeping changes in agricultural production in parts of Asia and Latin America. It shifted countries from recurrent famine to a level of production that enabled them not only to meet their domestic needs but also to export a surplus. International and national plant breeding research institutes have continued to improve varieties of these and other crops for medium to high-potential areas, and the private sector is heavily involved in plant breeding research and seed marketing for these areas.

But as described in chapter 4, the successes of the Green Revolution have not been replicated where hunger still persists, especially in Sub-Saharan Africa. The rainfed agriculture of Africa is far more complex than the irrigated systems of Asia, requiring improved plant varieties with markedly different traits (such as early maturity, multiple food and fodder uses, and tolerance to drought and low nitrogen). Maintaining and, where possible, enhancing the diversity of these systems is essential to their stability and sustainability. Higher value crops, trees, and livestock are the most important options for diversification open to poor smallholder farmers.

Much has been achieved through global research to improve basic food crops. But there has been a bias toward the crops grown in more favored areas, with less attention to those suitable for more difficult environments, such as millet, sorghum, root crops, bananas, and the pulses. Despite the expansion of the international research system to cover these commodities, there is still an inadequate allocation of resources to the traditional food crops grown in marginal lands by resource-poor farmers—and, at the other end of the spectrum, to the high-value crops, including oil seeds, horticultural crops, and tree crops needed to allow small-scale farmers to diversify.

Resistance or tolerance to such stresses as drought, salinity, low soil fertility, pests, and diseases are important genetic improvements that will benefit the food-insecure. Some exciting developments are occurring in stress tolerance

Greater diffusion of early-maturing varieties will be especially beneficial

research and development. One is unfolding in southern Africa, where at least 20,000 tons of improved seed of new stress-tolerant open-pollinated maize varieties were available for planting in the 2003–04 cropping season, enough to plant 1 million hectares. These varieties have markedly higher yield potential under conditions of drought and low nitrogen levels in the soil—two problems that frequently affect food-insecure farmers in marginal areas. Another is the 400,000 hectares of quality protein maize varieties that are now planted in Sub-Saharan Africa, a figure that could easily double by 2007. Quality protein maize has much higher levels of lysine and tryptophan than normal maize.

Greater diffusion of early-maturing varieties will be especially beneficial to resource-poor farmers in drought-prone areas. Extra-early improved varieties of maize, wheat, rice, sorghum, millet, cowpea, and cassava are now available in West Africa, and may prove adaptable to lowland tropical areas of Eastern and Southern Africa. Early-maturing varieties give farmers added flexibility in managing their cropping systems, by expanding the “planting window.”

Progress has been made in developing dual-purpose food-feed varieties of a number of crops, such as sorghum and cowpea. These varieties should be widely tested with farmers and, where results merit, aggressively promoted. Biotechnology can do much to improve the efficiency of planting-breeding and dissemination of improved planting materials (box 6.3).

Once researchers have developed useful varieties, significant challenges remain in multiplying and distributing the seed, especially to resource-poor farmers located in remote or marginal farming areas. There is a need for a considerable expansion of privately funded seed multiplication to address marginal areas and resource-poor farmers. In the long run the private sector is likely to dominate seed production and distribution for favored areas and for high-value seed products such as F1 hybrid varieties. Given appropriate incentives and well organized partnerships with governments and NGOs, private seed growers and companies can also be persuaded to produce seeds for poor people. An essential ingredient of such partnerships is to offer growers a guaranteed price for seed that meets various important pro-poor criteria.

Informal seed delivery systems, involving NGOs and farmer organizations, will be needed to complement more formal seed delivery systems. Effective seed distribution will depend on establishing rural markets and developing much better rural road systems. The task force recommends that countries aim to develop seed and livestock production and distribution systems (through agrodealers and other channels) that can achieve 50 percent adoption rates by food-insecure farmers of key staple food crops, trees, grasses, fodder crops, and livestock breeds.

Diversify on-farm enterprises with high-value products

After soil and water constraints have been largely overcome and smallholder farmers are using improved varieties of basic food crops, many farmers become

Box 6.3**Plant
biotechnology**

Source: Adapted from FAO
2004b.

A common question following a Task Force on Hunger presentation is our stance on biotechnology. We do not support either extreme in the biotechnology debate—that biotechnology is the key to eliminating world hunger, or that it is a major threat to the environment, food safety, or poor farmers. Some forms of biotechnology, such as tissue culture, are uncontroversial. The contentious debate focuses on gene transfers among plant species and between plants and other phyla. For example, the advent of genomics took plant breeding out of the realm of intuition and keen observation by plant breeders into a world in which it is possible to manipulate genes directly. This allows genetic improvements in a more quantifiable and predictable manner.

We believe that it is important for biotechnology to focus on traits that are important to poor and hungry farmers in the basic staple foods of the poor such as cassava, millets, rice, wheat, and white maize (FAO 2004b). There are already examples among poor farmers in South Africa of cotton bearing the Bt gene from a bacterium reducing the need for insecticide applications, lowering costs, and reducing the threat of insecticide toxicity to the environment and human health. Agricultural researchers are also developing “Golden Rice,” inserting dandelion genes that encode the precursors of vitamin A into high-yielding rice, perhaps to reduce this key micronutrient deficiency from millions of rice eating people.

Poor farmers need improved varieties that are tolerant to major fungal, bacterial and viral diseases as well as insects, more tolerant to drought and salinity, and more able to take up nutrients from the soil with larger root systems, as well as those with better protein quality and micronutrients (FAO 2004b). Biotechnology research on soil microorganisms may result in major advances in soil health.

Transgenic research must be done with adequate safeguards under scientifically based protocols approved by each developing country. Reviews of many scientific bodies of genetically modified crops recognize the potential of biotechnology to address critical problems in agricultural productivity and nutrition. We believe that agricultural research must continue to explore the potential benefits of biotechnology to safely and equitably address the needs of the poor and is more responsive to societal needs.

food-secure enough to take the next step of diversification into livestock, vegetable crops, fisheries, and trees that produce high-value products. Diversification increases farmer incomes, addresses nutritional deficiencies, and is the first step out of poverty. Diversification not only generates income for individual farmers—it also enhances the whole rural economy.

For African women, combining the production of food and agricultural cash crops with nonfarm income-earning activities has long been a survival strategy which allows them to reduce the risk of starvation for themselves and their families during periods of chronic or transitory food insecurity (Devereux 1993; Maxwell and Frankenburger 1992). Due to the smaller plot sizes of poor rural female-headed households, increasing yields of food crops will not be sufficient to cover the yearly food consumption requirements of the family. The policy solution for female-headed households is therefore to diversify land use—and take some small amount of land out of the subsistence crop and

Box 6.4
Cash cropping for
women farmers

Source: Gladwin and others
2001.

Intensification, diversification of food production, and cash cropping by women farmers are interdependent, requiring a complex strategy. Constraints to immediate expansion of women's cash cropping—such as women's roles as food provisioners in the household and the problem of cash crops as culturally part of the male domain—need to be overcome. Programs should ensure the following elements:

- Encouraging women's cropping of very profitable cash crops, nonfarm microenterprises, and agricultural labor that will bring in cash to the household. Cash cropping on a small portion of women's land devoted to subsistence can be encouraged by women's clubs, which give credit to women for fertilizer for both food and cash crops, to be repaid from proceeds of the cash crop. Government can encourage women's earning cash income by expanding microcredit programs for women.
- Aiming agricultural research programs at increasing women's returns to their land as part of the overall package. The goal is to discover sustainable and affordable agricultural technologies while taking into account the diversity of livelihood systems needed by women farmers.
- Provide "fertilizer safety nets" or "fertilizer-for-work" programs targeted at the chronically food-insecure. In the short term, public works programs will improve the food security of participating households if the time spent on them does not conflict with food production activities. Such programs could possibly lead to improvements in longer term food security, depending on how the additional income is used within the household.

plant it to a cash crop. Yet cash and food crop production by African women farmers are interdependent (see box 6.4).

In this section we outline four methods for diversification with high-value products through raising livestock, planting farm trees, investing in fisheries and aquaculture, and planting vegetables.

Livestock

Livestock production provides an important opportunity for smallholders to diversify their diets and sources of income, while generating manure that can improve soil health. In many African countries the livestock sector contributes 20–30 percent of agricultural GDP, yet the continent has a large trade deficit in livestock and livestock products. The InterAcademy Council (IAC 2004) urged special attention to the role of livestock in African farming systems. The InterAcademy Panel report identifies poor nutrition, diseases, and poor genetic potential as the major constraints to the intensification of smallholder crop-livestock systems.

Increases in milk production can reduce hunger, malnutrition, and food insecurity in both rural and urban settings, at both household and national levels. The protein and micronutrients contained in milk, eggs, and meat are especially needed by the most severely affected food-insecure groups—women and children in poor households. The dilemma has always been that these

**Farm
communities
must have
opportunities
for moving
beyond
subsistence
agriculture**

groups are the least able to secure livestock, because they lack the cash to buy them or the assets needed to raise livestock.

In mixed crop-livestock systems, significant gains can be achieved—even for the semi-landless and especially for vulnerable household members—through improvements in productivity and livestock herd or flock size. Small intensive production systems with dairy products, eggs, and poultry for income are the most suitable (Heifer International 2004). Programs modeled on Heifer International have disseminated such animals to poor farmers and communities, achieving sustainability by the simple requirement of having recipients repay the program with the female offspring of the initial animal.

It is more difficult to improve the systems of nomadic pastoralists. Levels of hunger are high among herders, but many of the proposed solutions to their problems have proved wrong. Pastoralists are highly efficient users of grazing and water resources, and if allowed to continue with their mobile lifestyle, they can exceed the efficiency of any comparable ranching or sedentary system (UNDP 2003). For them, improved breeds are usually not the solution to their challenges. Pastoralists are constrained by competition for land as cropping expands, by a lack of veterinary services, and by the remoteness of markets. In all cases access to veterinary products is extremely important, because of the large role livestock products play in human nutrition.

Farm trees

Given rapid urbanization in developing countries, farm communities must have opportunities for moving beyond subsistence agriculture to supply products demanded by urban dwellers. The sale of tree products—such as timber, fruit, fuel, fiber, fodder, and medicine—can raise the cash incomes of poor households, providing a platform for greater food security and prosperity.

Unsustainable harvesting from natural forest, the biodiversity concerns about large-scale monoculture, and smaller farm sizes have increased interest in smallholder timber production throughout the world. Although climate, markets, and grower profiles differ between tropical and temperate regions, developing countries in the tropics have often failed to recognize the potential of the small independent producer. In several countries, this group is emerging as the largest supplier of timber products for national consumption and export.

In India, where the High Court banned the extraction of timber from state-owned forests to reduce deforestation, farmers are now supplying the bulk of the nation's domestically produced timber products. The agroforestry sector in Haryana and Punjab states, where poplar and eucalyptus grown for timber are intercropped with cereals and fruit trees such as mango, is now part of a \$500 million domestic industry poised to compete with annual imports valued at \$2 billion. Indeed, most of the timber produced in the tropics is now grown on small to medium farms, not on large commercial plantations. This

**Women
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stocks of
fish and
other aquatic
resources**

trend is likely to accelerate, with smallholders emerging as the timber suppliers of the twenty-first century. The domestication of indigenous fruit trees, done throughout tropical Africa, can lead to new sources of farm income and rural jobs, as it has in parts of Asia and Latin America.

For diverse farming systems the establishment of trees on the farm enhances the natural assets of poor farmers. Trees may be grown for a wide range of purposes including soil fertility and conservation, the fencing of gardens and livestock paddocks, home garden development with fruit trees, shrubs and palms, riparian re-vegetation for the protection of water sources, and timber to be harvested to meet long-term needs, such as children's education. Tree species can also be used to restore degraded areas—a win-win proposition since both farmers and the environment gain. There is a critical shortage of tree seed in most poor rural areas, so the most important priority for increasing the use of trees is to start tree nurseries—small enterprises that can create employment opportunities for women and youth.

Fisheries and aquaculture

Those involved in fisheries are among the poorest in the developing world. The WorldFish Center (ICLARM) estimates that more than 30 million people are directly employed in primary capture fisheries and aquaculture, while another 200 million depend on fishing as part of their livelihood. Fish are a healthy source of protein, calcium, vitamin A, and essential fatty acids. But given declining catches and rising demand in urban areas, many of the poor cannot afford to eat the fish they catch. For many of the urban poor, fish is the only source of animal protein, so increasing the supply of low-cost fish will contribute significantly to their diets.

Women play a key role in fisheries and aquaculture, especially in processing and marketing. They are likely to be the hardest hit by declining stocks of fish and other aquatic resources. They are also likely to benefit most from efforts to improve the productivity of this sector. Small aquaculture can also diversify livelihood options for poor farmers, increasing income while reducing risk and vulnerability. Technical impediments include the lack of high-quality fingerlings, the lack of high-quality low-cost feed, diseases, and competition for water (IAC 2004).

Vegetables

Vegetables are vital for healthy diets. They provide a rich source of many essential micronutrients, including vitamins C and K, folate, thiamine, carotenes, several minerals, and dietary fiber. More than 2 billion of the world's people—mostly women and children in the tropics—do not have adequate access to vegetables. In some parts of the world, this situation is due to lack of awareness about the benefits of vegetables. Elsewhere, vegetable production is constrained by pests and diseases and the availability of well adapted varieties.

**To be
effective,
extension
usually
requires
considerable
public
investment**

The Task Force on Hunger sees the incorporation of vegetables into farming systems, feeding programs, and household diets as an important dimension of nutritional improvement. Efforts should be stepped up to extend knowledge about the production and preparation of vegetables. Well adapted germplasm, of indigenous as well as exogenous species, is needed. The World Vegetable Center, the International Plant Genetic Resources Institute, and national partners should be supported in their efforts to develop and disseminate suitable vegetable production systems in low-income countries.

Establish effective agricultural extension services

The major role of extension services is to provide information and training to farmers. Yet smallholder farmers, especially food-insecure ones in remote areas of poor countries, frequently lack access to extension services—or to most of the other services that support agriculture. To be effective, extension usually requires considerable public investment. Its high cost has inhibited most developing countries from investing adequately in it. This has led to a dependency on donor projects and NGOs, which may also lack the resources and often the technical know-how to do the job properly.

Much technical support has focused on more favored production areas and larger scale farmers. It has often been delivered in a top-down fashion by advisors who have had scant and inappropriate formal training and whose in-service training is little better. In addition, operational support has often been woefully inadequate, preventing extension workers to visit poor farmers.

Problems often begin with the selection and training of extension staff. Many agricultural graduates in developing countries do not have farming backgrounds, and most have sought education to launch them on career paths that do not include difficult and arduous work with farmers in the field. Once qualified, there are few incentives—financial and otherwise—to attract the best graduates into extension work. Those who do end up in extension may not be the best people to advise farmers. For example, most extension workers are men, whereas most farmers are women. According to the FAO, only 5 percent of extension services have been addressed to rural women, while no more than 15 percent of the world's extension agents are women (FAO 1997). In addition, most of the extension services are focused on cash crops rather than food and subsistence crops, the primary concern of women farmers and the key to food security (FAO 1997).

Centralized, top-down organizational models have tended to give extension workers technological recipes rather than develop their diagnostic skills. Many of them seem to lack respect for the knowledge and skills of the farmers they are there to serve—and so are unable to work with them effectively. Finally, agricultural research is often poorly linked with extension services, and as a result extension workers lack knowledge of new technologies, while researchers remain ignorant of the real needs of farmers.

**It is important
that
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requirements
of women
farmers**

Despite these shortcomings, there are good agricultural extension practices and practitioners. These have promoted such innovations as farmer-to-farmer extension, local learning networks, the participation of farmers in trials and demonstrations, the training of farmer-researchers, the integration of local and traditional knowledge into research and development efforts, the deployment of locally recruited agricultural advisors, and “farmer first” extension and research. Much more attention has been placed on strengthening the capacity of service providers to respond to and support a farmer-driven agricultural development process. With the large number of women farmers in developing countries, it is important that these innovations address the special requirements of women farmers—requirements that may differ from those of their male counterparts.

Another bold and innovative approach is that of Ethiopia, where the government is seeking to reinvent extension by training 45,000 secondary school graduates to serve as paraprofessional extension workers. Each of the 15,000 villages covered in the first phase of this initiative will have a residential team of three agents, specializing in crops, livestock, and natural resources. These agents will interact with the professional ranks of the formal extension service. This admirable initiative could be further improved if trained nutritionists and healthcare and engineering workers were to join the teams.

The Task Force on Hunger strongly supports actions that involve and mobilize the farming community, specifically women, in improving extension services. Instead of relying on outside experts, selected farmers can be employed at a fraction of the cost to work with extension officials and deliver extension messages to other farmers. In this way the ideas and innovations of farmers can be combined with technological advice to ensure that the solutions proposed are the most appropriate. It is crucial these programs ensure that women farmers have equal access and participation in these programs.

Facilitators and intermediaries from NGOs, who have a proven track record as partners in participatory community processes, can provide support to such efforts. So can the general public. Successful models that could be scaled up or replicated include landcare association groups in the Philippines and South Africa and soil and water conservation groups in Kenya. One of the most impressive track records is that of farmer field schools in Southeast Asia, which have successfully promoted integrated pest management practices (FAO 2001c). The schools’ estimated 2 million graduates have cut pesticide use in half with no decline in yield. Progress is being made in developing the farmer field school approach to promote soil and water management, enhance the sustainability of crop and livestock farming systems, and address such socioeconomic issues as nutrition, HIV/AIDS, microfinance, business management, and financial sustainability through income-generating activities. Similar institutions are needed to address the technical needs of herders, fishers, and forest dwellers.

Extension should give priority to participatory processes that enhance local decisionmaking and support the interventions recommended by the Task Force on Hunger. These are the key entry points for increasing agricultural productivity and natural resource management—and thus for reducing hunger and poverty. Subject matter specialists, well versed in the range of options related to these factors of production (including farmer-based innovations), will be critical to training frontline extension workers and farmers. Links to other vital agricultural services—especially input delivery, seed multiplication and distribution, grain storage and agro-processing, and marketing—will also be critical.

Improve soil health

Actions needed to implement recommendation three

Facilitate expanded access to inorganic fertilizers through public investments, including short-term targeted subsidies. Use innovative strategies, such as “smart cards.” Expand the use of agroforestry, green manures, cover crops, and other biological methods to improve soil fertility, weed control, and moisture conservation. Stimulate the development of private distribution networks for these inputs, focusing on rural agrodealers. Scale up training and information provision to teach farmers how to use soil fertility restoration techniques effectively.

Relevant government ministries should lead these efforts, with others (the private sector, civil society, research agencies, and donors) providing supportive mechanisms. By 2015, 25 million additional smallholder farmers should be using organic or inorganic fertilizer and improved soil and water conservation methods.

Improve and expand small-scale water management

Stimulate the adoption of water conservation and management techniques, matching appropriate technology with local conditions. Provide training and extension services, and support organizing efforts of community groups, to facilitate technology adoption and community resource management. Investment in decentralized planning, funding, and management is key to effectively scaling up these techniques. A broad range of stakeholders should support these efforts, including national and local government authorities, civil society and community groups, research organizations, donors, and local financial institutions. The goal should be to extend these technologies to 10 million smallholder farms worldwide by 2015, with need and cost-efficiency guiding the priorities.

Improve access to better seeds and other planting materials

Strengthen the capacity of national research systems to develop improved crop varieties with traits needed by hungry farmers in marginal lands. Promote public-private partnerships to develop and produce quality seeds by increasing incentives.

Promote community-based production of seeds. Encourage farmers to preserve traditional seeds while adopting new ones. Encourage the responsible use of biotech seeds, together with effective biosafety standards. Develop seed and livestock production and distribution systems (through agrodealers and other channels) that can achieve 50 percent adoption rates nationally in key staple food crops (maize, rice, wheat, barley, sorghum, millet, pulses, cassava, potatoes) and livestock breeds by poor, food-insecure farmers. Achieve comparable results in the improvement of trees, grasses, and fodder crops. Promote rural business development and training, and devise market-based incentives for distribution and adoption of seeds that benefit food-insecure farmers.

Involve public research institutions, private companies, NGOs, and local farmers' associations as well as farmers and extension workers. Target 20 million households for adoption of improved varieties by 2015.

Diversify on-farm enterprises with high-value products

Increase livestock production in food-insecure communities to expand access to milk, eggs, and meat and raise incomes. Assist in establishing small-scale intensive production systems for dairy products, eggs, and poultry. Promote small-scale aquaculture to provide low-cost fish for food-insecure communities.

Establish tree nurseries, using small enterprises to fill critical shortages of tree seed in rural areas. Promote tree-growing to supply timber, fruit, fuel, fiber, fodder, and medicine for household use or sale, or for land conservation purposes. Promote the incorporation of vegetables and fruits into farming systems, to generate micronutrient and economic benefits. Conduct public education and training on vegetable production and preparation.

Establish effective agricultural extension services

Train and deploy 100,000 new village extension workers in food-insecure areas (75 percent in Africa) by 2010. Increase the proportion of women extensionists to 50 percent by 2015.

Expand extension services in marginal areas, and sharpen the focus on women farmers. Emphasize participatory technology development, and high-impact, high-value innovations—particularly in soil health, water management, and improved varieties. Expand farmer-to-farmer extension, deploy locally recruited agricultural advisors, increase farmer participation in research, field trials, and demonstrations, and integrate local and traditional knowledge into research and development efforts, and “farmer first” extension. Use information technologies to improve effectiveness of extension programs. Do independent, quantitative evaluations of impact.

Facilitate and increase the accountability for coordination between research, extension services, and community farmers' organizations.