Feeding the World in the Coming Decades Requires Improvements in Investment, Technology and Institutions

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\textbf{ABSTRACT} The world is food secure at the global level, yet nearly 800 million are food insecure. “Business as usual” is not going to bring us close to meeting the Millennium Development Goal of halving the proportion of the population consuming less than the minimum energy requirement. So what has to change? The three papers in this session offer clues in three broad areas: (a) increased investment—by developing and developed countries—in public goods such as agricultural research, education, and clean water, (b) technologies to boost agricultural productivity for the poor and institutions that guide the diffusion and application of technology that need to be developed, and (c) national-level institutions and governance structures to be strengthened and held accountable for protecting and respecting human rights, for providing the right types of national-level public goods to those that most need them and for preserving peace and stability. J. Nutr. 132: 3435S–3436S, 2002.

\textbf{KEY WORDS:} \textbullet \ hunger \ textbullet \ investment \ textbullet \ technology \ textbullet \ institutions \ textbullet \ Africa

There is enough food to feed every person adequately, at least in terms of calories, yet 777 million in the developing world do not have enough to eat. The reasons for this apparent contradiction are many and include low-productivity agriculture where the poor live, lack of income, poor governance, conflict and war, human immunodeficiency virus/acquired immunodeficiency syndrome and natural disasters. The rate of progress in addressing food insecurity during the 1990s does not inspire. There have been reductions in poverty, improved access to food and declines in malnutrition in the 1990s, but progress has been slow and uneven.

During the course of the 1990s, the Food and Agriculture Organization of the United Nations estimates that the number of energy-deficient individuals in the developing world dropped from 816 million to 777 million (1). Omitting China, the numbers for the developing world actually increased from 624 million to 650 million. World Bank data on poverty rates show a similar pattern. Without the progress shown by China, there were 25 million more people living on less than a dollar a day at the end of the 1990s compared with the beginning of the decade (2). The United Nations Children’s Fund reports that the number of underweight preschool children has declined from 174 million in 1990 to 150 million in 2000, but again, without the progress shown by China, the results are much less encouraging (3).

Business as usual is not going to bring us close to meeting the Millennium Development Goal of halving the proportion of the population consuming less than the minimum energy requirement (4). So what has to change? The three papers in this session offer clues in three broad areas:

(a) There must be increased investment—by developing and developed countries—in public goods such as agricultural research, education and clean water.

(b) Technologies to boost agricultural productivity for the poor and institutions that guide the diffusion and application of this technology toward their needs must be developed.

(c) National-level institutions and governance structures need to be strengthened and held accountable for protecting and respecting human rights, for providing the right types of national-level public goods to those who most need them and for preserving peace and stability.

\textbf{Investments}

Mark Rosegrant and Siet Meijer (5) describe past trends in global child underweight rates and future prospects for reducing child malnutrition. Using a global model of food supply, demand and trade, they generate projections of per capita dietary energy supply. They combine these projections with assumptions about trends in women’s education, male-to-female life expectancy and access to clean water to project progress in reducing underweight rates of children younger than 5 years to 2020 under three scenarios: business as usual, pessimistic and optimistic. Their business as usual projections estimate that the number of underweight children under the age of 5 in the developing world will decline by only 21\%, from 166.3 million in 1997 to 131.5 million in 2020. In Sub-Saharan Africa, with its combination of high

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population growth and lagging economic performance, the number of malnourished children is projected to increase by 6 million compared with 1997. Under the optimistic scenario, progress is significant, although 94 million children will be malnourished by 2020.3

How much will the optimistic scenario cost? Looking at investment in five key sectors—irrigation, rural roads, agricultural research, clean water provision and education—the difference between the business as usual baseline and the optimistic scenarios is $10 billion per year over the period 1997 to 2020. To put this into perspective, it is worth noting that the Farm Security and Rural Investment passed by the U.S. House of Representative in May 2002 will provide up to $5 billion per year in additional spending to help U.S. farmers (6).

Technology

Some of the extra resources needed to accelerate reductions in malnutrition will be needed for the development of technologies that are relevant to the needs of the malnourished and that can be used by them, without intellectual property rights becoming a barrier. Jennifer Thomson’s (7) report outlines some of the areas in which biotechnology can make a difference in the lives of the poor: (a) resistance to viruses, especially endemic ones that affect the crops that the food insecure tend to consume, such as maize and cassava; (b) drought tolerance using genes from indigenous crops; (c) resistance to both preharvest and postharvest fungi; (d) insect resistance, which is especially important, given that insect-attacked crops such as maize are more susceptible to aflatoxin-producing fungi postharvest; and (e) enhanced nutritional quality of food by introducing and/or increasing nutrients such as rice high in vitamin A and iron.

Thomson highlights the need for caution when it comes to biotechnology development by stressing the need to do no harm to human health and the environment. But, as she notes, Sub-Saharan Africa needs to dramatically increase overall levels of food production, and this is feasible only through smallholder agriculture. Thomson’s report summarizes the role biotechnology can play in raising farm production through three pathways: by increasing the amount of land cultivated (e.g., through drought-resistant crops), by increasing the productivity of existing land (e.g., through resistance to insects, fungi, and viruses) and by improving the nutrient content of crops grown. If this potential is to be realized it is not only the safety issues that need to be carefully monitored but also the flow of benefits to the food insecure.

Sub-Saharan Africa and Institutions

Regardless of the extent to which national governments believe that their sovereignty is impaired by international trade arrangements, they still have many policy instruments to bring to bear on the malnutrition status of their people. Thus, in all societies, government officials should be held accountable by their peoples for their performance in reducing poverty and malnutrition. The report by Mandivamba Rukuni (8) shows how investment, technology and national institutions must interact to bring about food security in Sub-Saharan Africa, the region of the world where all indicators of hunger are worsening.

Against a backdrop of famine in Malawi and human immunodeficiency virus/acquired immunodeficiency syndrome, civil conflict and declines in the prices of traditional exports throughout much of the region, he stresses the need to increase agricultural productivity in the smallholder commercial sector as a way of increasing food availability and rural incomes and lowering the price of food for all net food purchasers, in rural and urban areas alike. He notes that globalization of trade, financial flows, information and technology can help or hinder development depending on circumstances. However, for many in Africa, this debate is academic because they have not invested in the physical or social infrastructure or the human resources necessary for engagement, for better or worse, with globalizing nations.

A key element in the drive to improved smallholder agricultural productivity is to develop smallholder-driven farmer support services. Rukuni notes that institution building takes a long time and that this kind of time horizon is often at odds with donor funding and reporting cycles. Important functions of these new institutions would be to respect and protect land rights, both formal and informal, and to deliver formal financial services to the poor, designing the financial services so that they are responsive to the stated needs of the poor. In this way smallholder agricultural productivity can be improved to generate more food, more income and greater trade revenues.

Conclusions

Malnutrition and food insecurity are not being eradicated fast enough; in Africa, they are on the increase. The resources to significantly reduce this tragedy are not that large. Technologies to improve the productivity and nutritional quality of crops are being developed. There is an increasing recognition of the key role that institutions have to play as to whether new resources and technologies are directed toward the needs of the malnourished or whether they are indifferent or even antagonistic toward those needs. Institutions at international, national and community levels need to represent those who are malnourished and those who are working to reduce malnutrition. We tend to think of food, care and health as the holy trinity of good nutrition. Perhaps it is time for an additional trinity—governance, technology and investment—to be recognized if we are to even get close to meeting the Millennium Development Goals. They are only 13 years away.

LITERATURE CITED


3. Schooling and sanitation indicators increase by 10%, life expectancy ratios by 4%, the gross domestic product growth rates in the developing countries by 25%, yield growth rates in developed countries by 10% and in developing countries between 10% and 20% and area growth rates by 10%. There is a 1% irrigation growth, low United Nations population projections, and consumer and producer taxes for trade that remain the same compared with baseline.