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IFPRI

INTERNATIONAL FOOD POLICY RESEARCH INSTITUTE

2001-2002



“Human rights and environmental protection now have worldwide lobbies, but the fight against poverty and hunger does not ... A person who is hungry suffers a violation of his or her dignity ... To change this, the fight against hunger and poverty has to be put at the very top of the political agenda all across the world.”

— Johannes Rau, President
Federal Republic of Germany

ESSAYS

AIDS: The New Challenge to Food Security

Food Security as a Response to AIDS

IFPRI

INTERNATIONAL FOOD POLICY RESEARCH INSTITUTE

The International Food Policy Research Institute (IFPRI®) was established in 1975. IFPRI's mission is to identify and analyze alternative national and international strategies and policies for meeting food needs of the developing world on a sustainable basis, with particular emphasis on low-income countries, poor people, and sound management of the natural resource base that supports agriculture; to make the results of its research available to all those in a position to use them; and to help strengthen institutions conducting research and applying research results in developing countries.

While the research effort is geared to the precise objective of contributing to the reduction of hunger and malnutrition, the factors involved are many and wide-ranging, requiring analysis of underlying processes and extending beyond a narrowly defined food sector. The Institute's research program reflects worldwide collaboration with governments and private and public institutions interested in increasing food production and improving the equity of its distribution. Research results are disseminated to policymakers, opinion formers, administrators, policy analysts, researchers, and others concerned with national and international food and agricultural policy.

IFPRI is one of 16 Future Harvestsm agricultural research centers and receives its principal funding from governments, private foundations, and international and regional organizations, most of which are members of the Consultative Group on International Agricultural Research.

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CONTENTS

TABLE OF CONTENTS

Message from the Chair of the Board of Trustees	
Geoff Miller	2
Introduction from the Director General	
Per Pinstrup-Andersen	4
Essays	
AIDS and Food Security	10
AIDS: The New Challenge to Food Security by Peter Piot and Per Pinstrup-Andersen	11
Food Security as a Response to AIDS by Stuart Gillespie and Lawrence Haddad	18
Research and Outreach	30
Environment and Production Technology	31
Food Consumption and Nutrition	42
Markets and Structural Studies	56
Trade and Macroeconomics	62
Communications	67
A 2020 Vision for Food, Agriculture, and the Environment	76
Collaboration 2001	80
Publications 2001	86
Personnel 2001	94
Board of Trustees 2001	98
Donors 2001	99
Financial Statements 2000-2001	100
Future Harvest	102

MESSAGE

FROM THE CHAIR OF THE BOARD OF TRUSTEES



The year 2001 was a remarkable year for IFPRI, with performance at an exceptionally high level across a broad range of the Institute's activities. In recognition of his leadership of IFPRI and of his personal and professional achievements, our director general, Per Pinstrup-Andersen, was awarded the World Food Prize. The whole IFPRI community joins me in congratulating Per and sharing our profound pride in his accomplishments.

The second year of the new millennium also witnessed the horrific events of September 11—which were close to home for IFPRI staff—and the ensuing military response. The result has been a dramatic escalation in global insecurity.

The insecurity caused by terrorism inevitably provokes powerful immediate responses. However, the restoration of global security will require that other causes of insecurity be addressed in parallel. Very important among these are poverty, hunger, malnutrition, and the downward spiral caused by unsustainable use of natural resources. Developing policies and programs to reduce food insecurity is IFPRI's core business. IFPRI's agenda has never been more important than it is today. Fortunately, IFPRI has never been more effective in advancing it.

During the year, the Institute held its second 2020 Vision international conference, *Sustainable Food Security for All by 2020*, in Bonn, Germany. We were honored to have the President of Germany and the Prime Minister of Uganda address us. Participants also included senior policymakers from governments and international organizations; prominent scholars; leaders of business, industry, and nongovernmental organizations; and farmers.

They came from developing and developed countries alike to discuss a broad range of food policy issues. Although the views they expressed differed, attendees concurred that food security needs to be much higher on the global policy agenda. A number of senior officials from both the South and the North agreed to lead a follow-up effort to achieve this.

Partly in support of this extremely successful conference, IFPRI issued a great many new technical and popular publications during the course of 2001. Increasingly, the Worldwide Web disseminates IFPRI's materials instantaneously, to whoever accesses our site. Traditional print publications are also available. We are pleased that The Johns Hopkins University Press, which has long published IFPRI books, has broadened our partnership and is helping us distribute in-house publications as well.

We publish our research results in order to influence policies so that they advance food security and lead to fewer hungry and malnourished people in the world. It was gratifying, therefore, to learn that IFPRI's favorable independent evaluation of PROGRESA, Mexico's large-scale social service program for rural poor people, was cited by the Inter-American Development Bank as a

major reason for its award of \$1 billion to support and expand the program.

In 2001, IFPRI concluded research on priorities for public investment in rural China, the results of which were presented at a major conference. We are pleased that Chinese policymakers respect the results and have continued to consult IFPRI researchers about how to use this research to improve the well-being of rural poor people in the world's largest country.

IFPRI researchers working on globalization published an op-ed article in the *International Herald Tribune* just as negotiations on agricultural trade were about to take place in Geneva. In Bonn, those same researchers were able to discuss the key issues with the incoming director general of the World Trade Organization. Again, IFPRI research is making a difference.

The two featured essays in this report address the devastating impact of the HIV/AIDS pandemic on food security, yet another critical issue where IFPRI seeks to identify policy options to advance food security and reduce poverty. Peter Piot, the director of UNAIDS, joins IFPRI's Per Pinstrup-Andersen in presenting an overview of this scourge. Stuart Gillespie and Lawrence Haddad explain the vicious cycle that links HIV/AIDS and malnutrition in a downward spiral of impoverishment. Gillespie is collaborating closely with other Future Harvest research centers to look at possible policy options for mitigating the impact of AIDS on food security. Their article identifies knowledge gaps that can be addressed with further research.

In 2002, we will bid farewell to Per Pinstrup-Andersen after a decade of truly astounding leadership. A considerable amount of the Board's energy during 2001 was devoted to a thorough, open, and comprehensive search for his successor. As a result, we will welcome Joachim von Braun, a world-renowned food policy researcher, as the next director general. He is no stranger to IFPRI, having

spent several years as a research fellow and division director before he returned to academic work in Germany. More recently, he has served on the International Advisory Committee to IFPRI's 2020 Vision Initiative.

Following the selection process, the Board has focused on managing an effective and efficient transition to a new leader. It is a measure of the exceptional quality of both the outgoing director general and his designated successor that both have been proactive participants in an extraordinarily well-managed transition. I have no hesitation in predicting an effective outcome over the course of 2002.

Finally, I record my deep appreciation of the work of all of IFPRI's people and my gratitude to every member of the Board of Trustees. All of our trustees are exceptional professional leaders in their own right. Each makes a unique contribution to the governance of IFPRI. It has been a privilege to facilitate the exercise of their wisdom.

Marc Cohen, as Board secretary, and Bernadette Cordero, as executive assistant to the Director General Search Committee, made exemplary contributions to the Board's business. Donal O'Hare, as consultant executive officer for the Search Committee, was thoroughly professional and diligent.

Working with all of IFPRI's people has been simultaneously a rich and humbling experience. With no one has this been more so than with Per Pinstrup-Andersen.



Geoff Miller

Chair, IFPRI Board of Trustees

INTRODUCTION

FROM THE DIRECTOR GENERAL



As I complete 10 years as IFPRI's director general, I look back on a very exciting period both for IFPRI and for me. During these 10 years, recognition has increased of the importance of policies and institutions in eradicating hunger and malnutrition in a manner compatible with sustainable use of natural resources. We need to understand how to design and implement cost-effective policies to achieve that goal. Such awareness has translated into a strong demand for the kind of research and outreach that IFPRI undertakes. Our budget and our productivity have increased very significantly.

As the quantity of IFPRI's output has increased, we have made great strides in assuring that the relevant research for which IFPRI is known continues. By means of broad consultative processes, we have set priorities that reflect future needs for knowledge. And we have strengthened IFPRI's human resources to the point where IFPRI's staff is second to none. IFPRI's credibility as an unbiased provider of new, high-quality knowledge has grown.

IFPRI's research priorities have changed a great deal during the last decade. We are placing much greater emphasis on the interaction between natural resource management and productivity increases in agriculture and on identifying appropriate policies and institutions to assure sustainable productivity increases. Our research on policies related to water management and allocation, land use, land degradation, and property rights to natural resources has gained wide recognition. IFPRI research has shown that some developing-country governments need to expand investment in public goods for less-favored areas and that returns to

both poverty alleviation and agricultural growth can be higher in these regions in some countries than additional investments in irrigated and high-potential rainfed areas.

We urgently need additional knowledge to put in place institutions and policies at both national and international levels to guide globalization so that it benefits the poor. Accordingly, IFPRI has expanded its research on the impact of trade liberalization on poor people and on what national and international policies need to change in order to benefit the poor. In the same context, IFPRI is expanding its work on domestic markets for agricultural inputs and outputs as well as credit markets. And, as illustrated by the articles on HIV/AIDS in this report, IFPRI is building on many years of research on household food security and nutrition to examine further the relationship between health and food security.

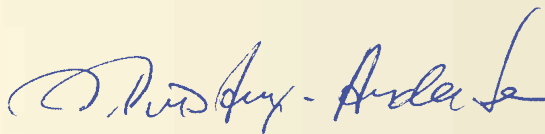
To harness modern science to benefit poor farmers and consumers in developing countries, IFPRI is expanding research on modern biotechnology's applications to developing-country food and agri-

culture conditions. We hope to learn what policies and institutions incorporate the scientific approaches now available for the benefit of poor people.

Many other issues require additional research, including rapid urbanization in developing countries and cost-effective poverty reduction programs.

While IFPRI is not an advocacy group, we are strengthening our communications capability to disseminate research results to wider, more diverse audiences. We hope to reach not only policymakers and researchers but also the news media and the general public more effectively. The 2020 Vision Initiative has been IFPRI's most successful effort to synthesize research results and bring them to the attention of various stakeholder groups.

As we look to the future, demand will grow for the kind of knowledge IFPRI produces. Policy and market failures are responsible for much poverty and human misery and additional knowledge is required to correct these failures. A world where more than 1 billion people are poor, where 800 million are food insecure, and where every third preschool child in developing countries is malnourished will not and cannot be a stable world. IFPRI must strive to achieve our 2020 Vision of a world free of hunger and malnutrition where natural resources are managed in a sustainable way. With an extremely capable staff, IFPRI is poised to make that happen.



Per Pinstrup-Andersen
Director General, IFPRI



Essays



AIDS

AND FOOD SECURITY

Poor people in developing countries struggle continually to fight hunger, malnutrition, ill health, and deepening poverty. The alarming spread of HIV/AIDS has made their struggle even more difficult. Hit by this syndrome, the poor lose their ability to work, to feed themselves and their families, to ward off disease, to maintain their assets, to transmit essential farming knowledge to their children, and to remain connected to their communities. Eventually they lose their lives. Families, communities, and whole nations in Africa are being devastated by HIV/AIDS at such a rapid rate that some expect almost a third of their populations to die prematurely. This demographic nightmare will substantially reduce economic growth in Africa. It will also affect the economies of Asia as the pandemic gains a foothold there. The multiple effects of HIV/AIDS at all levels of society make it imperative that the development community adapt all policies and programs to prevent the spread of HIV/AIDS and mitigate its effects. The following essays explore the reciprocal relationship between food security and HIV/AIDS and what it means for policy.

AIDS: THE NEW CHALLENGE TO FOOD SECURITY

by Peter Piot and Per Pinstrup-Andersen

W*hen you ask people living with AIDS in rural communities in the developing world what their highest priority is, very often their answer is food. Not care, not drugs for medical treatment, not relief from stigma, but food.*

It is easy to forget in the complicated world of global AIDS politics that for many people around the world, AIDS is one additional burden on top of many others. AIDS does not occur in a vacuum. People's basic concerns remain the same as they have always been: a secure, decent livelihood for themselves and their families.

In Africa, where the pandemic is currently the most serious, AIDS emerged against a backdrop of extreme poverty, hunger, conflict, and inadequate infrastructure. The impact of AIDS has been to make pre-existing problems and their consequences far worse, and to create daunting new problems. By killing people in the prime of their lives, when they would normally be raising their children and practicing their professions, AIDS erodes the social capital that makes communities function. AIDS has decimated the very generation of young adults poised to take Africa's future into their own hands.

THE PROBLEM IS MASSIVE

AIDS is one of the greatest threats to global development and stability and a long-term humanitarian crisis of unprecedented proportions. The death and misery it has caused in the past 20 years dwarfs all of the natural disasters that have occurred in that time combined.

Since the epidemic started, more than 60 million people worldwide have been infected with the virus, equivalent to the population of France or Britain, or nearly double the population of California. Twenty million have died.

HIV/AIDS is by a large margin the leading cause of death in Sub-Saharan Africa and the fourth-biggest global killer. AIDS has caused average life expectancy in Sub-Saharan Africa to drop from 62 to 47 years. In 2001 alone, an estimated 5 million people became infected with HIV, and half of them were between the ages of 15 and 24. An estimated 800,000 children under 15, mainly infants, were infected with HIV in 2001, and 580,000 children died of AIDS.

Sub-Saharan Africa is the region of the world where the epidemic has hit hardest and where its impact increasingly threatens the stability of whole societies. Average prevalence in Sub-Saharan Africa is 8.8 percent in the adult population (15 to 49 years old). There are seven countries, all in the southern cone of Africa, where more than one in five adults is HIV-positive, and another nine countries where infection rates exceed 10 percent.

While the scale and impact of AIDS in Sub-Saharan Africa is the worst in the world, HIV is rapidly expanding in other regions. In Asia, China, and India, overall prevalence is relatively small, but because of their huge populations, each country has large numbers of HIV-positive people. For example, the Indian states of Maharashtra, Andhra Pradesh, and Tamil Nadu, each with over 50 million people, have HIV rates above 3 percent for pregnant women, over four times the national average.

In Southeast Asia, Thailand and Cambodia have brought major epidemics under control, but there are emerging epidemics in Myanmar and elsewhere. In the Caribbean and Central America, a number of countries are over the 2 percent prevalence level. In Eastern Europe, the epidemic has been explosive, with a staggering 1,300 percent increase in infections between 1996 and 2000, mainly among young people, and fuelled by injection drug use.

This list of the most affected countries is depressingly familiar to those who have worked on food security and nutrition for many years. It is no coincidence that the maps of HIV prevalence and malnutrition overlap. The HIV epidemic is increasingly driven by the very factors that cause malnutrition: poverty, conflict, and inequality. Malnutrition exhausts the immune system, making people more susceptible to tuberculosis, malaria, and other infectious and parasitic diseases, even in the absence of AIDS.

While the scale and impact of AIDS in Sub-Saharan Africa is the worst in the world, HIV is rapidly expanding in other regions.

AIDS Is DIFFERENT

AIDS is not just another health or development problem. By its nature and effects, AIDS is unique.

- AIDS kills the most productive—and reproductively active—members of society, thus increasing the number of dependent household members, reducing household productivity and caring capacity, and interrupting the transfer of local knowledge and skills from one generation to the next. The effect on the household may be permanent.
- HIV is socially invisible, though the ravages of AIDS are everywhere apparent. The private nature of sex and complex cultural attitudes toward it lead to silence, denial, stigma, and discrimination at many levels. Moreover, 90 percent of those living with HIV have no access to HIV testing. This makes effective prevention and mitigation efforts difficult.
- HIV has a very long incubation period between infection and major illness, during which the virus can be transmitted. Combined with invisibility, this increases the chances of HIV transmission.
- HIV/AIDS affects both rural and urban populations. The death of one or more income earners in rural households often forces survivors to migrate to seek work in cities. The death of an urban worker may force sur-

vivors to send children back to rural areas to be raised in extended families. Migrant workers who become infected in cities go back home to their villages to die.

- HIV/AIDS infects people of all income levels throughout the developing and developed world. Everywhere, the poor face the most severe impact. AIDS prolongs and deepens poverty, making it harder to escape.
- HIV/AIDS affects both sexes but is not gender-neutral. Women, especially younger ones, are biologically more susceptible to contracting HIV than men in a given sexual encounter. The low social status of women in the developing world magnifies their vulnerability. Where women are marginalized and powerless, they are unable to negotiate sexual relations with men or control their reproductive lives. In many cultures, women are forced into early marriage, obliged to marry a dead husband's brother even if he is HIV-positive, and unable to refuse sexual relations with husbands who frequent prostitutes. Women in war zones are at great risk of sexual assault, including gang rape. Dire poverty and the inability to feed their children drive many women into prostitution, making exposure to HIV increasingly probable.

- As the pandemic intensifies, local capacity to respond decreases. Teachers, medical practitioners, and other essential professionals are dying in large numbers, leaving huge gaps in the social services most needed at this time. Organizations and businesses located in areas with high HIV/AIDS prevalence suffer high absenteeism, high staff turnover, loss of institutional memory, and reduced innovation. As individuals in government and nongovernmental organizations die, the capacity gap—between what is needed and what can be delivered—is becoming an abyss.

These are some of the unique features of the HIV epidemic. But just how does HIV/AIDS relate to food and nutrition security? And what type of remedial policy and programmatic responses does such a relationship suggest?

Vicious synergies are at work from the individual to the macroeconomic and societal levels. After an individual becomes infected with HIV, the progression of the disease and the person's worsening nutritional status reinforce each other in a downward spiral that ends in death. At the household level, HIV/AIDS and food security are also linked by negative synergies. An HIV-affected household's risk of food insecurity and malnutrition increases because sick family



members can't work, well family members must spend time caring for the sick person instead of working, income declines, healthcare expenses increase, and less time is available for competent adults to care for young children. Food insecurity, in turn, may lead to the adoption of livelihood strategies that increase the risk of contracting HIV as well as rendering the household more and more vulnerable as the disease progresses. Important community-level impacts go beyond the aggregated household impacts.

But consider for a moment what is happening at the macro level. AIDS has a direct impact on rates of economic growth in the most affected developing countries. There is a direct relationship between the extent of HIV prevalence and the severity of negative GDP. When the rate of HIV in a population reaches 5 percent, per capita GDP can be expected to decline by 0.4 percent a year. And when HIV reaches 15 percent, a country can expect an annual drop in GDP of more than 1 percent.

The cumulative impact of HIV on the total size of economies is even greater. By the beginning of the next decade, South Africa, which represents 40 percent of Sub-Saharan Africa's economic output, is facing a real gross domestic product 17 percent lower than it would have been without AIDS.

In settings where subsistence agriculture predominates, measured economic productivity only scratches the surface of the total impact of HIV on livelihoods. For example, AIDS reduces long-term capacity for agricultural production, since livestock is often sold to pay funeral expenses and orphaned children lack the skills to cultivate crops or tend livestock.

AIDS kills people, not just economic activity. We should reflect on what it means for a society when 10, 20, or 30 percent of the population is HIV-infected. With today's rates of infection, a 15-year-old boy in Botswana has more than an 80-percent lifetime risk of dying from AIDS. Nurses and teachers are dying faster than they can be replaced. Last year, around 1 million African schoolchildren lost their teachers to AIDS. In Malawi, 6 to 8 percent of the teaching workforce dies each year. AIDS has orphaned nearly 14 million children. In Sierra Leone, the war left 12,000 children without families; AIDS has already orphaned five times that number.

WHAT WE CAN DO

We are not powerless in the face of AIDS. The tide is turning. Over the past few years, there has been a revolution in the world's thinking about HIV. The epidemic has been understood not only as a health issue, which it will always remain, but



also as a major threat to development and to human security.

HIV/AIDS is being mainstreamed across sectors in increasingly unified national responses.

But just how can sectors such as agriculture help? How should government policies be altered to meet the needs of the poor within the context of the HIV/AIDS pandemic? What should a minister of agriculture do? Should s/he accelerate and intensify the implementation of agricultural development and poverty reduction policies and programs, or should they be redesigned first? If so, how?

Filtering the problem of food insecurity through an HIV/AIDS lens is a way to re-view the relationship between hunger and HIV/AIDS and can help people in the agricultural sector choose livelihood strategies that minimize risk and/or mitigate impacts. Indeed, the very notion that the agricultural sector can ameliorate the consequences of the pandemic in the medium to long term is new to many. The fresh angle of vision further highlights the need to avoid compartmentalizing responses into prevention, care, support, and mitigation. Food and nutrition are clearly critical in the care and support of people with HIV/AIDS. But the ways in which livelihoods could be adopted and adapted to ensure that families avoid the virus have only recently been appreciated.

The HIV/AIDS lens will be fine-tuned over time based on improving knowledge, and will be different in different contexts, ruling out one-size-fits-all blueprint planning. In addition to

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re-viewing food security programs through the HIV/AIDS lens, we can and should be re-viewing AIDS programs from the perspective of availability, utilization, and access to food.

THE BIG CHALLENGES

Despite what we know about how to combat the epidemic, we are still a long way from achieving

success. The major challenges for timely research and action on HIV/AIDS and food security are highlighted below.

Include HIV-impact statements in all development plans. Major investments for development are being planned as if HIV were occurring on another planet. We need to improve our understanding of the impact of rural development on the spread of HIV. Just as environmental impact assessment has become an integral part of development programs and major projects, HIV impact assessments should also become the norm. HIV has not yet been fully integrated into poverty reduction strategies, multilateral development bank programs, or in regional and global development strategies. Fortunately this is changing.

Will agricultural development plans break up family structures and add to HIV risk? What plans are there for addressing HIV risk if new transport routes are created? What is the HIV-related impact of cash cropping on food security? These are important questions to be addressed from the very outset of development planning processes, and need to be an integral part of the World Bank's Poverty Reduction Strategy Papers, as well as health planning.

Break the link between food insecurity and HIV vulnerability. Along with responding to the immediate impacts of AIDS, we must continue to pay attention to program sustainability and to overcoming long-term vulnerability. What crops are nutritious enough to substitute for commonly raised labor-intensive crops? For example, cassava requires very little labor but contains very

little protein. What are the long-term nutritional effects of switching to cassava for populations that require more protein? How do we keep children in school when there is so much pressure for them to replace the labor of sick or dying parents? The United Nations Children's Fund (UNICEF), one of eight cosponsoring UN agencies that comprise the Joint United Nations Programme on HIV/AIDS (UNAIDS), is extending the role of schools as community resource centers. The World Food Programme (WFP) is using food aid to provide an incentive for children to stay in school. Along with the International Service for National Agricultural Research (ISNAR), IFPRI is working with local partners in several Sub-Saharan African countries as part of a newly launched multicountry initiative that aims to strengthen local capacity while undertaking action-oriented research on priorities generated at national stakeholder workshops.

Include nutrition as a core component of HIV care. Too often, care and treatment of people with HIV/AIDS is reduced to the issue of anti-retroviral drug prices. This reductive debate misses the complexity of the broad care issues facing



people living with HIV. It also fails to recognize the synergies possible by advancing the care agenda simultaneously on multiple fronts. The UNAIDS Secretariat and cosponsors have delineated a care agenda that includes providing psycho-social care, reducing the stigma against people living with HIV, and ensuring access to essential AIDS medicines, including anti-

retrovirals and treatment for opportunistic infections. The increased affordability of anti-retroviral drugs should be used as an opportunity to demand that medications be provided with clean water supplies and with food. We are not dealing with step-by-step solutions, but solutions where progress in one area will support progress in others.

Give HIV-infected women real options to protect their infants. We know that breastfeeding by HIV-infected mothers carries a significant risk of transmission, up to 20 percent in the absence of drug therapy. We also know that exclusive breastfeeding for the first six months of life is one of the cheapest, most cost-effective practices in public health and social development. Currently, HIV-infected mothers are advised to avoid all breastfeeding when replacement feeding is acceptable, feasible, affordable, sustainable, and safe. But we are a long way from either exclusive breastfeeding or universal access to safe replacement feeding, and even further away from offering voluntary and confidential HIV testing and counseling as a routine component of antenatal care. A great deal of work is required before mothers will be able to make an informed choice about breastfeeding.

Such work is already underway by UNAIDS and its cosponsors, especially UNICEF, and by governments in the most affected countries, with boosted support from philanthropic foundations.

Eliminate the stigma of HIV/AIDS. Stigma causes great social suffering, but it is also a nutrition issue. People with HIV have been thrown out of their homes or their villages and left hungry. One of the barriers to reaching those impoverished by AIDS with effective food replacement programs is the stigma-driven reluctance to identify those in most need. In order to overcome this problem, food programs are targeting AIDS-affected villages and areas rather than individual families. We also know that a woman may breastfeed in public to avoid stigma, but use formula in private to avoid transmission, unwittingly exposing her infant to the worst combination of feeding strategies.

Face the gender dimensions of AIDS. Addressing relationships between men and women is at the core of successful behavioral change to prevent the spread of HIV, including gender inequalities that make the impact of HIV fall harder on women, such as inheritance laws that prevent women from holding land or livestock upon the death of their husbands. We know that women are the caregivers for children who have lost their parents. They also provide more than half the care for those sick with AIDS. Women do more than half the food gathering and production work. Now,

Success comes from long-term commitment. By delivering responses that are rooted in communities, we build to the scale of response required.

they make up more than half of those living with HIV in Africa. Who takes care of the caretakers? When the women die, who will care for family members then?

Take action on a scale commensurate with the epidemic. The time for pilot or demonstration projects is over. Piecemeal approaches waste money and accomplish little. We must mainstream every

aspect of our work. Success comes from long-term commitment. We make a real difference when we ensure that local actors have the information they need to respond to the epidemic, and when systems and necessary resources are in place. By delivering responses that are rooted in communities, we build to the scale of response required.

AIDS, like malnutrition, is complex. The solutions to complex problems lie in adhering to the facts, and in building new partnerships, better coordination, and sustainable change. The partnership between those whose primary concern is food and nutrition security and those whose focus is HIV is in its very early stage and growing rapidly. We can be confident that the partnership will continue to grow, based on the knowledge that food and nutrition policies are integral to winning the race against AIDS.

Peter Piot is executive director of the Joint United Nations Programme on HIV/AIDS (UNAIDS) and assistant secretary-general of the United Nations. Per Pinstrup-Andersen is director general of IFPRI.

FOOD SECURITY AS A RESPONSE TO AIDS

by Stuart Gillespie and Lawrence Haddad

The HIV/AIDS pandemic in Sub-Saharan Africa has become increasingly intertwined with issues of food and nutrition. On the one hand, malnutrition and food insecurity may force households to adopt livelihoods that increase the risk of HIV transmission, such as migration to find work. On the other, HIV/AIDS may precipitate or exacerbate malnutrition and food insecurity.

THE VICIOUS CYCLE: HIV/AIDS AND MALNUTRITION

HIV/AIDS has direct impacts on nutrition for the individual, the household, and the community. HIV infection, compounded by inadequate dietary intake, rapidly leads to malnutrition. Persons living with HIV have higher than normal nutritional requirements: up to 50 percent more protein and up to 15 percent more calories. Yet they are likely to suffer loss of appetite and anorexia, thus reducing dietary intake at the very time when nutritional requirements are greatest.

Such interactions have grave consequences for the poor, who are more likely to be malnourished before they become infected. Malnutrition in turn shortens the asymptomatic period of HIV infection, hastens the onset of AIDS and ultimately death, and may also increase the risk of HIV transmission from mothers to babies.

Conversely, the onset of full-blown AIDS, and even death, may be delayed in well-nourished individuals who are living with HIV. Diets rich in protein, energy, and micronutrients can help prevent opportunistic infections.



Mother-to-child or vertical transmission of HIV—which may occur during pregnancy, at birth, or through breastfeeding—is a major nutrition issue. Recent studies in South Africa confirm that there is no significant difference in HIV transmission between babies who were exclusively breastfed by HIV-positive mothers for the first three months of life and babies who were never breastfed. Exclusive breastfeeding decreases exposure to dietary antigens and environmental pathogens that occur with the premature introduction of other foods and liquids, such as formula. The intestinal irritation and inflammation that may result allows direct contact of the virus with the infant's bloodstream. Exclusive breastfeeding for the first six months of a child's life should still be promoted.

HIV/AIDS also has important indirect impacts at the household and community levels. These may be brought about, for example, by a diminished capacity of adults to care for themselves, their young children, or sick household members.

HOW HIV/AIDS IMPACTS AGRICULTURE AND OTHER LIVELIHOODS

When HIV/AIDS strikes, it strips away assets of all forms—human, financial, social, physical, and natural (see sidebar). Human capital is the first casualty. Infected individuals die prematurely, before which their productivity declines progressively as they succumb to opportunistic infections.

One strategy for the agricultural sector in areas hit hard by HIV/AIDS is to reduce the amount of work necessary to raise crops. For the majority of rural populations with high HIV-prevalence in Sub-Saharan Africa and elsewhere, farming systems that are less dependent on labor will be more resilient to HIV/AIDS morbidity and mortality, at least in the short term. But there are trade-offs. For example, the fact that the cultivation of tubers is less labor intensive than other staple crops may be beneficial in the short term, but tubers happen also to be less nutritious. This may seriously compromise long-term nutritional status—unless other means to ensure dietary diversification are found.

HIV/AIDS has serious consequences for the commercial agricultural sector as well as for subsistence farmers. The commercial sector may depend on migrant labor, a group that is at high risk of expo-

Possible Impacts of HIV/AIDS on Agriculture-Dependent Households

- Adult becomes sick.
- S/he reduces work.
- Replacement labor is “imported,” perhaps from relatives.
- All adults work longer hours on the farm.
- Healthcare expenses rise (e.g., drugs, transport).
- Household reduces food consumption.
- Household switches to less labor-intensive crops and farming systems, small livestock.
- Nutritional status of sick adult deteriorates.
- Sick adult stops work.
- Family members spend more time caring for sick adult, less time on childcare.
- Divisible assets (e.g., livestock) are sold.
- Debts increase.
- Children drop out of school to help with household labor.
- Sick adult dies.
- Household incurs funeral expenses.
- Household may fragment as other adults migrate for work.
- Household reduces cultivation of land; more is left fallow.
- Inappropriate natural resource management may lead to increased spread of pests and disease.
- Effects of the loss of farming knowledge intensify.
- Mining of common property resources increases.
- Access to household land and property (particularly for surviving widows) may be affected.
- Solidarity networks are strained, possibly to the point of collapse.
- Surviving partner becomes sick.
- Downward spiral accelerates.

Source: Gillespie, S., L. Haddad, and R. Jackson. (2001). HIV/AIDS, Food and Nutrition Security: Impacts and Actions. In: *Nutrition and HIV/AIDS*, Nutrition Policy Paper No. 20. ACC/SCN: Geneva.

sure to HIV, especially if the laborer lives apart from his or her family. Conversely, the commercial sector could serve as a conduit for information and training on prevention, and might also provide opportunities for youth to learn essential agricultural skills.

The full impact of HIV/AIDS on human capital goes well beyond the large number of workers lost to premature debility and death. HIV/AIDS diverts the labor of healthy individuals to other crucial activities, such as caring for the sick and attending the funerals of those who have died. It also drastically abbreviates the ability of parents and other elders to transfer knowledge, both within their own generation and to the next. Young people lose their role models and primary educators. Children cannot draw on the body of knowledge that dies with their parents. Nor can they learn by doing under the guidance of someone more experienced.

HIV/AIDS impairs the ability of children to acquire and use information through formal education, as younger generations are pulled out of school to bolster the family's ability to provide care for the ill, to maintain its current livelihood, or to develop new livelihoods. Depriving children of an education exemplifies the dilemma of the ultimately destructive "coping strategy." Tomorrow's livelihoods are sacrificed in order to survive today.

HIV/AIDS damages financial capital in a number of ways. Drug, burial, and related transport

HIV/AIDS also drastically abbreviates the ability of parents and other elders to transfer knowledge, both within their own generation and to the next.

expenses strain already limited family budgets. In terms of financial capital services (credit, savings, and insurance), poor families either have to borrow money or sell stores of value (jewelry and livestock) and assets (equipment or tools). The poor invariably rely on informal credit at high interest rates or on group-based microfinance services, both of which are vulnerable to

aggregate shocks. A family affected by HIV/AIDS is less able to avoid default, and hence is less attractive to group-based liability schemes. The ability of microfinance institutions to respond to the changing needs of their clients will be crucial.

To defray large health and funeral expenses, poor families may sell productive equipment or mortgage land. Health infrastructure for the poor, if it exists at all, is overwhelmed as medical personnel sicken and die while demand for health services increases. As time becomes an ever-scarcer commodity in high prevalence areas, access to water and energy sources must be improved. This is critical, since these activities are socially determined to be the responsibility of women, who most often care for their family members, even when they themselves are sick.

HIV/AIDS may also undermine the ability of communities and user groups to pool risk and act collectively to manage common property, such as rangeland, cropland, and river basins, in a sustainable manner. Clear and equitable delineation of property and land rights becomes more important for individuals who leave their homes to search for

alternative livelihoods or to help friends and families outside of their community. If dwelling or land rights are linked to physical presence, property rights might be impaired, especially if widows and orphans are the primary claimants.

Social capital—the strength of associational life, trust, and norms of reciprocity—may be undermined by HIV/AIDS in several ways. Younger generations are not able to witness farming practices or experience the informal exchanges of knowledge, tools, and animal draught labor that occur under normal circumstances. Incentives for coordinated group action may be diminished because people discount the future benefits of such action. Formal institutions that also contribute to social capital formation, such as church groups, sports clubs, and professional associations, will be weakened as members die. Social networks whose members are highly mobile or live in urban areas will be more susceptible to HIV/AIDS. And finally, social capital may be weakened as existing networks ostracize people stigmatized by the disease.

USING AN HIV LENS

HIV/AIDS has finally been recognized as a major global developmental crisis, not just an isolated health problem. Responses need to be commensurate with the scale of the pandemic—not only in

terms of the coverage of those affected, but also with regard to the breadth and depth of sectoral involvement needed to address the wide-ranging impacts described above.

But how can HIV/AIDS be effectively mainstreamed into development policy? Advocacy clearly is key—both to communicate the dire consequences of a business-as-usual approach and to point to what works and where in prevention, care, and mitigation. An “HIV lens” is a useful conceptual tool to help understand appropriate policy and program modifications in the face of HIV/AIDS realities. Not everything will need to change, and it is important to avoid re-inventing the wheel. But a hard look is needed to reveal what needs to be done by different sectors to help stall the pandemic. Just as combination drug therapy revolutionized the effectiveness of HIV treatment, so too can combination prevention and mitigation stop the disease’s spread and lessen its impacts.

RE-VIEWING NUTRITION POLICIES AND PROGRAMS

The notion of multiple responses will be familiar to many who have supported community-driven nutrition programming in the developing world. To sustain improvements in nutrition, it is usually important to build partnerships and foster con-



vergence of relevant programs. But nutrition programs have always been vulnerable to bureaucratic inertia and compartmentalized organizational structures that offer few incentives for integration. A single nutrient focus has generally been preferred. Witness the prominence of vitamin-A capsule distribution and salt iodization during the 1990s, which, though successful, did to some extent crowd out other, longer-term holistic approaches to nutrition.

While micronutrient supplementation (particularly vitamin A) will certainly have a role in providing nutritional support to people living with HIV/AIDS, food is a crucial requirement—not least because the disease significantly raises energy and protein requirements that cannot be met by pills alone. For individuals living with HIV/AIDS, nutritional care and support—in the form of the essential food, health, and care ingredients of good nutrition—is necessary to prevent or forestall nutritional depletion. Nutritional support has the potential to prolong the asymptomatic period of relative health and ultimately prolong the lives of individuals, for their own benefit and for the young children who depend on them.

Outside the clinical setting, how can interventions target beneficiaries in ways that do not stigmatize

them? Targeting to affected communities, rather than to households, is likely to work best, with a second tier of targeting to young children and pregnant women, who are particularly susceptible and vulnerable at various stages in the life cycle.

When applying the HIV lens, program design may need to change to some degree. For example, the promotion of breastfeeding and complementary feeding should lay particular emphasis on the dissemination of clear information to policymakers, health providers, and communities about mother-to-child transmission, including the risks and benefits of breastfeeding. Such programs need to anticipate the fact that HIV/AIDS-affected households will have increased time and economic constraints for the provision, preparation, and feeding of appropriate complementary foods. Programs to address women's nutrition may not require substantial content changes, but they will need much greater support overall, especially for breastfeeding women.

HIV/AIDS-related nutrition programming should be not just community based, but as community driven as possible. Process is thus a major consideration. At the community level, the key is to create space and develop capacity for an iterative process of assessment, analysis, and action.



RE-VIEWING AGRICULTURAL POLICIES AND PROGRAMS

The options for policy and program response in agriculture can be grouped around the main impacts of AIDS: lost labor, lost knowledge, and weakened institutions. These tend to be most noticeable after the initial phases of the epidemic. Whenever asset depletion is the short-term response, these losses may be compounded in a downward spiral.

Discussion of HIV/AIDS issues can and should be included in agricultural services provision. For example, Integrated Pest Management (IPM) programs in southern Africa and Southeast Asia have incorporated information on HIV prevention, care, and mitigation into IPM training. Scarce extension resources may need to be targeted to higher-risk groups, such as seasonal agriculture and estate workers, and fishermen. Perhaps the most profound challenge to the agriculture sector in countries threatened by HIV/AIDS is the need to develop agricultural and natural resource management systems that require less labor and use fewer purchased inputs while still supporting sustainable livelihoods. In the absence of new technology and techniques, farmers are switching to feasible low-input, low-output farming. This move is unlikely to be a sustainable solution if productivity drops over time. The agricultural research community must develop farming practices that adapt to the reality of HIV/AIDS and yet maintain productivity levels. Farmers should be more

The agricultural research community must develop farming practices that adapt to the reality of HIV/AIDS and yet maintain productivity levels.

involved in research planning and implementation. The development of lighter-weight ploughs for use by women and youth is one example of such a technological adaptation to this new environment.

Some approaches already respond to the reality of HIV/AIDS and its impacts. To combat information and knowledge losses, farmer field schools employ experi-

enced farmers to share their knowledge with youth and widows. An initiative in Zimbabwe involves participatory training for women widowed by AIDS in the production of cotton, a crop normally grown by men. Extension services, themselves severely depleted by the epidemic, must focus more on youth. Recent research has emphasized the importance of trader-farmer information exchange and of other social relations and networks that embody reciprocity based on trust. HIV/AIDS can undermine this form of social capital. Mobile traders are relatively susceptible to HIV/AIDS and, given the already thin nature of agricultural markets in many parts of Sub-Saharan Africa, the consequences are likely to be serious. We need to support these networks.

Recent experiences from some of the severely HIV-affected countries have demonstrated that microfinance institutions can innovate and develop products to meet the needs of this emerging clientele. The role of such institutions and the NGO community that helps animate them will be crucial in the new HIV/AIDS battlegrounds of South and Southeast Asia, where so much microfinance innovation has already taken place.

Successful efforts to strengthen the institutions that support farming in the face of HIV/AIDS are difficult to find. An important first step is to improve the access to HIV-prevention information and technology for members of such institutions. Second, it will be necessary to assess the institutional strengths and weaknesses before considering appropriate approaches to sustaining and enhancing the capacity to respond to the pandemic.

PRIORITIES FOR RESEARCH

Given the scale of the pandemic, the research base upon which HIV/AIDS impacts are assessed and interventions for prevention and mitigation are evaluated is remarkably narrow. A small number of good studies have been published in refereed journals, and more exist in the unpublished literature. But many experiences are not reaching as wide an audience as they need to. Innovative practitioners have little incentive to document their experiences, given the complex environment

Mechanisms for sharing information and for giving those on the frontline a voice have to be found. This is the first priority.

within which they work. In addition, the silence surrounding HIV/AIDS may mute demand for such information. Mechanisms for sharing information and for giving those on the frontline a voice have to be found. This is the first priority.

Other priorities include the need to develop and apply tools for the rapid assessment of capacity, to undertake more basic

research on the dynamics of impacts at the household, community, and meso-levels, and to review existing food and nutrition policies and programs through the evolving HIV lens in order to seize opportunities for mainstreaming HIV/AIDS prevention and mitigation. The work must be timely and action-oriented for advocacy and ethical reasons, but it must conform to high scientific standards—a difficult but not impossible challenge.

Stuart Gillespie is a senior research fellow in and Lawrence Haddad is director of IFPRI's Food Consumption and Nutrition Division.



IFPRI's HIV/AIDS Initiative

Since 2000, IFPRI has been working with ISNAR and local partners on *HIV/AIDS, Food and Nutrition Security: Supporting Innovation*, an initiative to understand country-specific relationships between HIV/AIDS and food security and how such knowledge can make policies and programs responsive to the HIV/AIDS environment in each country.

Work under this initiative has begun in Malawi and Uganda and will start soon in Tanzania and Zambia. The project strengthens networks of concerned national agricultural and public health organizations, stresses national ownership and increased national capacity, and creates partnerships between members of two fields that, before the HIV/AIDS pandemic, may not have worked together. Now that they share a common cause, they are designing processes at the local and national levels to link their services for the benefit of people living with HIV/AIDS and their families. Stakeholders prepare and present background papers at workshops where participants seek consensus on governance and identify priorities for action and for research. Interdisciplinary country teams, with support from skilled persons within and outside their region, then carry out the research upon which action can be based.

To fully understand the impact of HIV/AIDS in severely affected countries, IFPRI is examining both macro and microeconomic effects. Due to the accumulated impact of a wide range of microeconomic effects, the pandemic will likely have a strong and sustained impact on the major channels related to overall economic growth. The most direct connection to growth is through a reduced population and labor force due to AIDS deaths. However, other indirect effects may be more important. For example:

- Deaths of teachers and widespread orphaning are likely to reduce educational attainment, resulting in reduced rates of human capital accumulation.
- HIV/AIDS patients often overwhelm the healthcare system, resulting in poorer average health even for non-afflicted populations. Combined with the generalized disruption associated with AIDS deaths, these health affects are likely to reduce productivity growth rates.
- As life expectancy declines, average savings rates are also expected to decline. This decline in savings, combined with greater caution on the part of foreign investors, can be expected to reduce investment.

Ongoing work under the auspices of a Trade and Macroeconomics Division initiative finds that since the pandemic can be expected to endure for a considerable period, even relatively small annual impacts combine to create large macroeconomic impacts over time. However, these impacts are not as well understood as they should be, particularly their poverty implications. Researchers in the Trade and Macroeconomics Division, with collaborators at Purdue University and elsewhere, are currently studying the links between HIV/AIDS, human capital accumulation, economic growth, and poverty reduction in Mozambique and Tanzania.



*Research
and
Outreach*



RESEARCH AND OUTREACH

In the next few decades, farmers will have to produce food for a world population that has reached 6 billion and is growing by about 80 million people every year. Most of this population growth is occurring in developing countries. Already about 800 million people lack access to enough food to lead healthy and productive lives. To assure food security for the poor amid growing developing-country populations, IFPRI conducts research to provide policymakers with sustainable solutions for ending hunger, poverty, and malnutrition. IFPRI seeks knowledge in four priority areas around which its research and outreach divisions are formed:

***Environment and Production Technology Division** identifies the approaches that encourage the adoption of appropriate agricultural technologies while arresting and reversing the degradation and exhaustion of the natural resource base.*

***Food Consumption and Nutrition Division** examines how policies, programs, and institutions affect the food security and nutritional indicators for nations, communities, households, and individuals.*

***Markets and Structural Studies Division** analyzes how market development and supporting infrastructure and institutions can guide the growth of rural economies so that the poor can benefit while competing in national and international markets.*

***Trade and Macroeconomics Division** analyzes how national policies and the international economic environment resulting from globalization and regional or international trading arrangements affect economywide growth, poverty, and the food, agriculture, and rural sectors in developing countries.*

*State-of-the art research has the greatest impact through state-of-the-art communication efforts. To ensure that the divisions' research results reach policymakers in both developed and developing countries as well as others who can benefit from new knowledge, the **Communications Division** serves IFPRI by publishing, publicizing, and disseminating its work.*

The following section describes the activities of these five divisions for 2001.

ENVIRONMENT AND PRODUCTION TECHNOLOGY

D*espite the abundance of food in the world today, some 800 million people still do not get enough to eat because they cannot afford to buy the food they need. Current agricultural systems are becoming unsustainable as the land and water on which they depend is degraded. And by 2020 there will be another 1.5 billion people to feed, nearly all of whom will live in developing countries. To respond to these challenges, the Environment and Production Technology Division (EPTD) is researching ways of increasing agricultural production in developing countries so that it enhances poor people's access to food and lowers food prices, but does not degrade the environment.*

“Solving these problems requires technologies that can improve yields and contribute to better natural resource management,” says EPTD director Peter Hazell. “It also requires that the right institutions and policies be in place to create opportunities for poor people and provide incentives to farmers and others to manage natural resources efficiently and sustainably.” EPTD’s research is structured around three goals: agricultural growth, poverty alleviation, and environmental sustainability. These goals are closely linked but whether they are complementary or competitive depends on each country’s mix of policies, technologies, and investment strategies. EPTD’s work seeks to understand and quantify the links for important types of agricultural ecosystems and to provide policymakers with the best options for achieving the three goals.

R&D MATTERS

When the Brazilian soccer team competes in the World Cup, they travel with the pride of their nation, the hopes of their fans, and sacks of black

beans. For many Brazilians, a meal without black beans is a meal without soul or comfort. But for most, black beans are the staple food. “In contrast to most other crops, Brazilian bean yields have failed to increase over the past 20 to 30 years, and would have declined in the absence of agricultural research and development (R&D),” according to Stanley Wood, a senior scientist who has been mapping agriculture throughout the world as part of a project investigating agricultural science and technology policy.

“The more we know about the spatial and geographical distribution of crops, population, and resources, the better we can identify exactly where new technologies, such as seeds or cultivation methods, would have an impact,” he says. In much of Africa, rainfall is more uncertain, soils less fertile, and pests and diseases more damaging than in the richer, temperate countries. Under such difficult conditions, “a lot of investment in agricultural R&D is needed simply to maintain the status quo, as the static productivity of Brazil’s black bean crop demonstrates.” Yet research is particu-

larly lacking on public policies that can improve the funding, performance, and impact of agricultural science and technologies worldwide, including their consequences for productivity, the environment, and the poor.

“In agriculture, you often have to run hard to stand still,” concurs senior research fellow Philip Pardey, who has been

analyzing investment and institutional trends in agricultural R&D worldwide. “And standing still is not enough. We’ve got a lot of food to grow between now and 2020 if we are to achieve the goal of cutting world hunger in half, and much of this will come about through investments in agricultural R&D. In early times, agricultural production expanded when the amount of land in cultivation increased. But today, great progress in yields is the result of improved know-how and new technologies, produced by scientists as well as farmers.” Pardey has found that though the amount of public funding allocated to agricultural R&D is still rising, the rate of growth of such investment is slowing. He is worried.

“The private sector can and is picking up some of the funding slack, but not throughout the developing world, where private investment is minimal,” Pardey says. “There are few incentives for private firms to invest heavily in agricultural R&D in poor countries any time soon. In the North, where the donors sit, the private sector accounts for half of all R&D. In the South, we estimate it’s around 5 or 6 percent. So the responsibility still rests with governments to continue and even expand their research investments.”

To curtail public spending just as agricultural science shifts toward biotechnology would be dangerously shortsighted.

To help donors and policymakers establish appropriate levels of R&D support, IFPRI and ISNAR this year jointly launched the Agricultural Science and Technology Indicators (ASTI) initiative website (www.asti.cgiar.org). ASTI compiles, processes, analyzes, and reports on internationally comparable data concerning institutional trends and investments worldwide.

ASTI conducts ongoing, original survey research on developing countries and provides links to comparable data for developed countries produced by the Organisation for Economic Cooperation and Development (OECD), the U.S. National Science Foundation, and similar agencies.

Pardey and colleagues have been evaluating the international flows of genetic resources, and the effects of Green Revolution technologies on both developed and developing countries. Their running hypothesis: the Green Revolution isn’t over. “Many think that it occurred in the 1960s and 1970s. But it could well be that even bigger gains were made from the mid-1980s to the end of the 1990s. We are now on the brink of another, perhaps more controversial, biotechnology revolution in agriculture involving the genetics of life,” he says.

In *Slow Magic: Agricultural R&D a Century After Mendel* (IFPRI 2001), Pardey and Nienke Beintema, coordinator of ASTI, emphasize that the miracle of agricultural science “stems from the slow and steady accretion of new knowledge” and note that the lag time between investment in

research and results is usually counted in decades. Donors and policymakers must therefore think long term. It is the accumulation of research results over many years that accounts for increased agricultural productivity. To curtail public spending just as agricultural science shifts toward biotechnology would be dangerously shortsighted.

At this juncture in the history of agricultural R&D, intellectual property rights are evolving rapidly and directly affecting public and private investment alike. “The public sector has to be aware of the consequences of changing intellectual property regimes and learn to live with the fact that the link between it and the private sector is becoming more contractual than collegial,” Pardey cautions. “Within the World Trade Organization, signatory countries are required to put in place the legal basis for intellectual property rights with respect to plant varieties and agricultural biotechnologies. Less developed countries have until 2005 to do so, but all must respond. There are potentially profound trade, food safety, and biosafety aspects of genetically modified crops. But for long-run food security, coming to grips with intellectual property rights is equally, if not more important.”

PUBLIC INVESTMENTS THAT HELP THE POOR

Mounting evidence from Asia suggests that investment in less-favored areas may increase agricultural productivity much more than was previously thought possible, actually giving higher returns than additional investments in high-potential areas. But ongoing macroeconomic adjustments in many developing countries are creating an uncertain climate for government investment in agricultural productivity and poverty reduction programs. IFPRI senior research fellow Shenggen Fan and his team are

analyzing the relative contributions of various public expenditures to help governments decide where to allocate their limited, often declining, financial resources.

Fan and colleagues have found that broad investments in agricultural research, education, and infrastructure, such as roads, bridges, electricity, and telephone service, have a bigger long-term impact on poverty reduction than antipoverty programs, even if the initial purpose of these investments was to promote growth. “Antipoverty programs that provide welfare subsidies or generate employment for nonfarm workers in public improvement projects help for a short while but do not produce permanent solutions to poverty,” Fan says.

China and India have both invested heavily in building and maintaining irrigation systems, but should now focus on increasing their efficiency, according to Fan. “We found that irrigation is no longer a priority investment,” he says. In India, state-level analyses show that additional government expenditure on roads has the biggest impact on poverty reduction and productivity growth, while additional spending on agricultural research and extension ranks second in the benefits it confers to the rural poor. Education also helps reduce rural poverty as a result of increases in nonfarm employment and rural wages.

In China, provincial-level analyses reveal that prioritizing rural education not only has the largest impact on poverty reduction, but it also reduces regional inequality, strongly promoting growth in the less-developed northwest and southwest regions. Agricultural research and development ranks first in promoting growth in general and agricultural growth in particular, but its impact on poverty is only one-third that of education and half that of roads.

Another important question is how governments should allocate public resources among regions to achieve the largest poverty reduction impact per dollar. During the era of the Green Revolution, developing-country governments invested in the rural areas deemed most likely to succeed: rainfed and irrigated lands. The results were spectacular. Economic growth and agricultural productivity increased dramatically, hunger and malnutrition declined. Decades later, however, productivity growth in high-potential lands has stalled and environmental problems have worsened.

At the same time, the presumed benefits to poor people in less-favored areas of investing in high-potential land—job opportunities to lure poor workers to high potential lands and towns, reduced population from out-migration in less-favored areas, increased per capita incomes from remittances sent by migrant family members, and reduced environmental degradation from a dwindling population—have not materialized to the extent expected. In fact, poverty, food insecurity, and extensive natural-resource degradation have grown in less-favored lands, due in part to investment bias against them. While more fertile lands flourished, less-favored lands with poorer soils, shorter growing seasons, and lower or uncertain rainfall languished. Neglect left already less-endowed areas with lower yields, limited infrastructure, and difficult access to markets, precipitating crises in food security for the growing populations there.

Disaggregated county-level analyses in China and district-level analyses in India show that public funding for rural infrastructure, agricultural technology, and human capital are at least equally productive in high-potential and less-favored lands, where such investments have a much higher impact on poverty reduction.

“Clearly, returns vary drastically across different types of investments, sectors, and regions, even within the same country,” Fan says. With that in mind, Fan wants to use the same analytical methods to help African governments design public investment strategies to reduce poverty and promote economic growth. “In Asia, we’ve already seen two or three Green Revolutions, but we’ve yet to see one in Africa. What made the Green Revolution possible in Asia? What can we learn from India and China that can be applied to African contexts?” Fan is not sure that his findings in India and China will be mirrored in Africa. But he’s hopeful that the research and analytical methodology developed in Asia can help African governments equally.

INVESTING IN LESS-FAVORED LANDS PAYS OFF

Walimbwa Eriya’s family is a typical farming household in Nemba, a small village in eastern Uganda. They live in a wattle and daub home with mud floors and a thatched roof. Walimbwa owns one cow, two goats, one pig, and three chickens. An experienced farmer who has participated in agricultural training and extension programs on annual crop management, he breeds small animals and grows maize, beans, groundnuts, cassava, bananas, and coffee.

Despite their hard work, the Eriyas face the same problems as 86 percent of Ugandans who live in rural areas and depend on agriculture for their survival: It is becoming harder and harder to provide food for the family. Yet they are hopeful. Eriya is one of 10 farmers in Nemba selected to participate in a household survey, part of a larger study of 107 villages where researchers from IFPRI and collaborating organizations have conducted community resource mapping and market, community, household, and plot-level surveys.

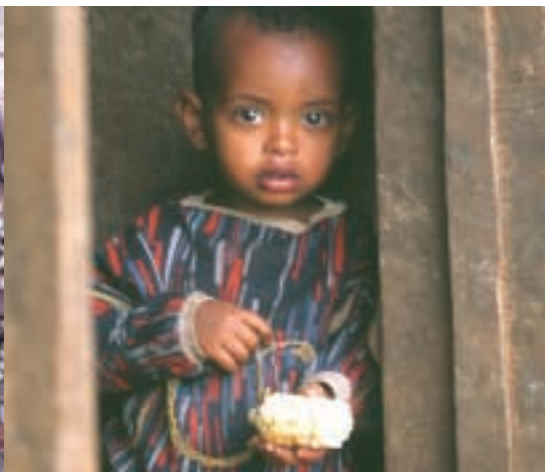
The goal of this research is to help people like the Eriyas by understanding how people at all levels—international, national, community, and farm—can work together to improve land management in less-favored areas, which face difficult agroecological conditions such as steep slopes, thin soils or limited rainfall, and limited access to markets and services. Rapid population growth in poor countries, maximum utilization of prime agricultural land, and declining agricultural productivity have obliged developing-country governments to consider investing in less-favored lands to increase national food supply. Worldwide, about 1.8 billion people live in these areas. To feed their families, farmers in regions with inferior agro-climatic conditions often deplete an already weak resource base and resort to encroachment on forest or woodlands, creating a self-perpetuating cycle of environmental degradation and poverty.

Is it worthwhile to invest in less-favored lands, and if so, what mix of public and private investments are needed to make them fruitful? IFPRI researchers are conducting in-depth studies on less-favored lands in Uganda, Ethiopia, and Honduras to ascertain current conditions and analyze the ecological and economic results of different development pathways. Though quite distinct culturally, politically, socially, and historically, Ethiopia and Uganda have much in com-

mon, according to IFPRI research fellow John Pender, who heads the study.

“Both countries are densely populated and suffer from food insecurity, poverty, and serious land degradation such as declining soil fertility and erosion. In addition, in both countries widely variable agroecological and market conditions require policy and program strategies targeted to specific situations. The one-size-fits-all approach to technical assistance programs or other policies is not likely to succeed in such diverse settings,” Pender says.

Working with Makerere University, agricultural agencies of the Ugandan government, the National Agricultural Research Organization, and the Center for Development Research at the University of Bonn, Germany, IFPRI researchers have investigated changes in many resource-degradation, poverty, and food-security indicators in Uganda since 1990, and the causes of these changes. “Many welfare indicators have improved,” Pender reports. “Access to transportation, consumer goods, education, and other services has improved in response to market liberalization and improved governance, as has the general wealth of the population.” Nevertheless there are troubling signs with regard to other indicators. “Our findings suggest that crop yields, soil fertility, and food security are declining in many parts of Uganda,” he warns.



People's perception that these factors have worsened raises a red flag about what needs to be done, Pender observes. "The assumption underlying Uganda's Plan for Modernization of Agriculture was that the commercialization of agriculture would lead to increased yields and food security. But that has not happened automatically." Presuming that as incomes increase, food security will also increase may thus be an erroneous assumption. It is also possible that commercialization is contributing to soil fertility depletion.

"It may simply be that the agriculture sector's response to increased commercialization has been slow, and that improved yields and food security will come as farmers begin to adopt more modern technologies," Pender says. "On the other hand, the shift from perennial food crops like bananas to annual cash crops like maize may be increasing food insecurity and soil nutrient mining. Food is less available year-round and greater quantities of soil nutrients are being exported to urban markets," Pender says. "Once we have analyzed the household data, we'll be able to draw clearer conclusions."

Some study findings already suggest solutions. "Building and repairing roads encourages farmers to improve their resources," Pender says. "And the national extension system needs to be further developed. Currently, NGOs offer many of the available extension services. But NGO projects tend to be located closer to roads and markets, so are not reaching many remote communities."

Policymakers in both Uganda and Ethiopia have contributed to the research and discussed the findings. National advisory committees comprising government officials from all levels, farmers' organizations, and representatives from the national research system in each country have met several times to review their needs and the status of the two projects. IFPRI held a well-

attended national policy workshop for stakeholders in Kampala in June 2001 to review and discuss the implications of the research findings. Final workshops in both countries will be followed by a larger policy conference on sustainable development strategies in the East African highlands region. That conference is co-sponsored by IFPRI, the International Livestock Research Institute (ILRI), and the International Centre for Research in Agroforestry (ICRAF); two CGIAR research networks, the African Highlands Initiative and the Soil, Water, and Nutrient Management Program; a regional network, the Eastern and Central Africa Program for Agricultural Policy Analysis; and the United Nations Economic Commission for Africa.

"I'm very glad to have the opportunity to work with people so concerned about the livelihood of farmers throughout East Africa," Pender says. "Through collaborative effort, we really have a chance to make a difference in the lives of many people."

THE QUEST FOR SOUND WATER POLICY

The human thirst for fresh water is insatiable and growing. In the last 50 years, the world's urban population increased by 2 billion; by 2025, another 2 billion people will join them, all in the developing world. Already, many cities have exhausted their proximate water supplies because they are overpumping the available ground water. Pollution from encroaching salinity and from human, industrial, and agricultural waste is rapidly reducing the quality and quantity of fresh water.

Population and economic growth in developing countries creates intense competition for water among agricultural, industrial, and household uses. "In developing countries, where fresh water is increasingly scarce, there is also new recogni-

tion that the environment itself demands water to maintain mangroves, river bank habitat, and aquatic species,” according to Mark Rosegrant, IFPRI senior research fellow and program leader of IFPRI’s water research. “Yet policymakers are reluctant to invest in new dams because they are expensive, can damage the environment, and often displace culturally unique populations. There is still some investment in new sources of urban water supply, but at a slower rate. Whereas high demand for irrigation water to feed growing populations continues, there is pressure to transfer water from rural areas and the agricultural sector to urban areas for use in the household and industrial sectors,” Rosegrant says.

The challenge is to develop water and agricultural policies that allow water to be released from agricultural to other uses while maintaining agricultural production, preserving rural livelihoods, protecting the rights of farmers, and improving water quality.

“Water is one of the most important assets in rural areas around which people build their livelihoods,” observes Ruth Meinzen-Dick, IFPRI senior research fellow and coeditor with Rosegrant of *Overcoming Water Scarcity and Quality Constraints* (Focus 9), a collection of briefs in IFPRI’s 2020 Vision series. “The question is, do rural people have to lose out in competition with cities, or can they share in the benefits? There are exciting works-in-progress to address the many complicated issues involved.”

Population and economic growth in developing countries creates intense competition for water among agricultural, industrial, and household uses.

For example, at a recent stakeholders’ workshop in Coimbatore, India, to discuss new IFPRI collaborative research on the effects of transferring water from agriculture to urban and industrial uses, the leaders of the farmers’ association from the nearby Bhavani River basin said that government policies that allocate more and more water from the reservoirs that irrigate their lands

to urban and other uses were hurting their livelihoods. The farmers called for urban people to conserve water as well. The leaders of a citizens’ action group to protect the Bhavani River showed a video of how effluents from factories were damaging the water quality, killing fish, and causing many human health problems. They called for stricter enforcement of effluent treatment standards to protect pure water, which they referred to as a birthright.

Farmers and residents in the Bhavani River basin are understandably concerned. Water has to be diverted from their basin to supply even rural domestic needs in the adjoining Noyyal River basin, where effluent from textile factories has been discharged into a reservoir designed to irrigate over 10,000 acres. The pollution has not only made it impossible to irrigate any of that land, but has made even the groundwater unsuitable for human or animal consumption. Emergency discharges of water from the reservoir have killed cattle downstream. At the same time, the factories have considerable economic and political clout, as they are major sources of employment and foreign exchange. The new research project looks at the consequences of this

intersectoral competition for rural livelihoods, and will try to find negotiated approaches that allow farmers and other rural water users to protect their interests.

Basin-level analysis of water scarcity and competition for the resource among agricultural, urban, and in-stream uses is an important tool to develop appropriate water allocation policies that take into account the needs of farmers as well as the overall basin economy. The Dong Nai River basin in southern Viet Nam is another basin that demonstrates many of the challenges and dynamic development processes that decisionmakers in the water sector face today. In the dry season, saltwater intrudes into the rivers, threatening the drinking water supply of the downstream population. Urban wastes and industrial effluents have converted the main canals in Ho Chi Minh City into open sewers. Investments in irrigation are slowing down, even though increased irrigation would help reduce the large number of people currently leaving the rural labor force every year, thus decreasing the pressure on urban areas. Finally, a whole range of infrastructure development options needs to be balanced with the current needs of the population.

On a smaller scale, inequities in water allocation and use are obvious in the various water-using sectors. Whereas people connected to public water supply in Ho Chi Minh City pay about US\$0.11 per cubic meter for up to four cubic meters per month per household, the poor in the outlying district of Can Gio must pay US\$1.30 per cubic meter for water in the dry season, a price that does not include time, transportation, and storage costs. Similar allocation issues reign in the irrigation sector.

Farmers in the relatively poor Binh Thuan and Ninh Thuan provinces face irrigation service fees for dry-season rice of US\$31 and US\$22, respectively. Farmers in the peri-urban areas of Ho Chi Minh City pay much less, approximately US\$10, because

the local government can draw on urban income to subsidize peri-urban irrigated agriculture.

COMMON OWNERSHIP AND COLLECTIVE ACTION

Thomas P. “Tip” O’Neill, a U.S. congressman from Boston, had a simple philosophy. “All politics is local,” Tip said. And “people like to be asked.” These principles of community participation have been at the center of IFPRI’s rangeland management research in developing countries, part of the Future Harvest Centers’ Collective Action and Property Rights initiative (CAPRI).

Property rights and collective action affect resource use and investment activities in the developing world, such as grazing land practices, forest and agroforestry resource use, soil fertility, maintenance of indigenous irrigation schemes, and watershed management. In many countries, land reform agendas have concentrated almost exclusively on privatization and individual titling, without fully considering either the true costs involved in transforming property rights, in enforcing these claims, or in calculating the benefits that access to nonprivate resources provide, especially in highly variable environments. Expanding the analyses to consider the true costs and benefits of alternative property rights gives a better idea of the efficiency, equity, and sustainability of alternative property rights regimes. The central question is what types and combinations of property rights and collective action institutions are needed in different situations to achieve the best patterns of development?

West Asia and North Africa

As population pressure in West Asia and North Africa mounts, land is becoming scarce and natural resources are being degraded. In the 1950s, rangelands provided 70 percent of feed for small ruminants. Today, natural grazing provides only 10 to 30 percent, due to continuously expanding

flocks and removal of vegetation to convert pasture to farming or to use as fuel.

Tribes in these countries are still strong, challenging each other and national governments for authority over and management of common lands. Whose herds get to graze on public pasture and when is a matter of survival in rangelands, which are universally characterized by low rainfall, rainfall variability, declining productivity, encroachment of or conversion to cropping, increasing impoverishment of tribal peoples, conflicting use rights caused by inappropriate land policies, and multiple, contradictory state, customary, and religious legal systems.

National governments in the Mashreq and Maghreb (M&M) countries have tried to address different types of land tenure reform in an effort to stem productivity and natural resource losses using three main approaches. Most M&M-country governments appropriated rangeland resources, introduced tenure reforms, and organized tribal communities into cooperatives. But it is difficult to balance the rights and roles of traditional pastoral communities with those of the state, and in most cases, state policy and institutional reforms were unsuccessful. Traditional institutions continued to manage rangelands informally even without the legal right to do so. Conflicts and disputes resulted, underscoring the necessity for a legal framework to support reform.

A second approach strengthened customary tribal property claims and gave pastoral communities full control over their resources using traditional mechanisms and rules to define access and resource use for all members. But this failed to address intercommunity issues. And confining livestock to tribal pastures reduced the mobility that allowed flocks to follow the feed, long considered a valuable survival strategy for pastoralists. Morocco and Tunisia experimented with a third approach, which privatized and titled tribal land and shifted the balance from collective to individual land and eliminated the flexible access that had offered a safety net to herders during drought.

“Many governments hesitate to rely on tribal systems or to make local communities responsible for rangeland development because there are no legal frameworks to secure community rights or to provide incentives for sustaining the resource,” IFPRI research fellow Tidiane Ngaido explains. Ngaido directs data collection and analysis for the M&M regions in Jordan, Morocco, Syria, and Tunisia, part of the larger joint, CAPRI-funded IFPRI/International Center for Agricultural Research in Dry Areas (ICARDA) project that also includes Algeria, Iraq, Lebanon, and Libya. “But different approaches to rangeland management in low-rainfall areas demonstrate that both tribal and government participation are essential. The government’s role is to provide a legal framework by which to grant and guarantee tenure security,” he says.



Sub-Saharan Africa

A team of staff from IFPRI, ILRI, and the Programme Sahelian Burkinabé conducted recent research in Sub-Saharan Africa. “We collected data in Burkina Faso that would enable a comparison with research already undertaken in Niger and Ethiopia,” according to IFPRI research fellow Nancy McCarthy, “but we also sought specific information on the northeast region of Burkina Faso,” to realize the study’s goal of generating results that are comparable across countries as well as adaptable to country-specific issues. Ascertaining the characteristics of the natural resource base was the first step, which included identification of resource-management incentives for households; collection of data on the structure, conduct, and performance of various institutions within the community; and market access and price data.

The results indicate that communities can and do cooperate over the management of natural resources—either through cooperative societies or more informal traditional mechanisms—but the extent to which they are successful differs across communities. There is evidence that building on local knowledge and traditional structures to create more formal structures often leads to better resource management, and that increased market integration does not have a negative impact on cooperation (and in some cases increases cooperation), but that large communities with heterogeneous populations engaged in different livelihood strategies do find cooperation more costly. In the Burkina Faso case, increased cooperative capacity leads to lower stock densities, greater herd mobility, and more land in common pastures. It also leads to greater household income from livestock products and to higher total income. Communities with low cooperative capacity tend to encroach on common grazing land.

Rangelands Management Conference

The CAPRI-sponsored International Conference on Policy and Institutional Options for Rangeland Management in Dry Areas, held in Tunisia from May 7-11, 2001, convened policymakers and research scientists to explore property rights and collective action in dry areas of the Middle East, North Africa, and Sub-Saharan Africa. Participants focused on identifying the appropriate roles, rights, and responsibilities of state- and local-level institutions in rangeland management. Though local knowledge and community participation are prerequisites for sustainable management, the state must ensure that local institutions represent the interests of all community members, not just the wealthy elite. In many cases, it is the role of the state to create legitimate conflict resolution mechanisms. Conference participants emphasized the need to incorporate rangelands management in the larger context of national-level development plans.

Participants also agreed that legal frameworks that reduce uncertain and ambiguous property rights must be developed, since ambiguity often leads to open access and resource degradation. At the same time, the legal framework must incorporate the valuable aspects of flexible access to multiple resources while minimizing the potential for resource overuse or abuse by herders or households. Sharing resources increases flexibility, but may diminish the capacity of communities to regulate resource use. A system of mixed rights to different resources may very well be required. In Ethiopia, for example, 23 percent of community land is open to all tribal members; about 50 percent is reserved for the community, though outsiders may negotiate access to use it; 12 percent of rangeland is de facto private; and 15 percent is private usufruct cropland.

Seeing the Forest for the Trees

The publication in 2001 of *Land Tenure and Natural Resource Management: A Comparative Study of Agrarian Communities in Asia and Africa*, a Johns Hopkins University Press/IFPRI book edited by Keijiro Otsuka and Frank Place, culminated IFPRI studies in seven countries on the management of land and trees. Begun in 1993, these studies in Ghana, Uganda, Malawi, Indonesia, Viet Nam, Nepal and Japan examined customary land tenure and common property.

Customary land tenure rules reward individuals who plant and manage trees with strong individualized land rights, which provide strong incentives to develop agroforestry—especially growing commercial trees—on less-favored tracts, such as degraded and sloping land. This contributes to the efficient use of resources, reforestation, and increased incomes of poor people. Where land is collectively owned, however, land titling programs aimed at establishing private rights create insecure tenure and

There is evidence that building on local knowledge and traditional structures to create more formal structures often leads to better resource management.

conflicts among family members.

The common property system, in which community members jointly own and use tree and other forest resources, manages nontimber forest products efficiently. While the common property system does not provide incentives in high-value tree production areas for timber forest management,

community ownership is effective when the predominant resources produce minor forest products. This finding suggests that community-wide forestry projects based on high-value timber products should replace the system of sharing benefits equally with systems that give individual farmers the incentive to manage timber trees. Granting complete tree ownership rights to individuals while maintaining community ownership of the land might be the right mix of public/private strategies. This approach strives to optimize private efficiency and promotes growth that leads people out of poverty, as well as other socially desirable outcomes.



FOOD CONSUMPTION AND NUTRITION

N*utritional status has been formally recognized via the Millennium Development Goals as an important indicator for assessing progress in improving human well-being. More than an indicator of current development, nutritional status is an indicator of the productivity and health of the next generation and of a nation's commitment to human rights. Improved nutrition for the world's poor creates the conditions for improved outcomes over a wide range of sectors and areas: higher educational performance, increased earnings and livelihood security, better HIV/AIDS prevention and mitigation, improved rates of child survival, lower rates of noncommunicable chronic disease, diminished chances of civil conflict, and lower rates of population growth are just some of the benefits. "If governments spent as much time worrying about why their children do not grow as they do about why their economies do not grow, we would see accelerated malnutrition reduction and maybe even increased economic growth rates," says Lawrence Haddad, director of the Food Consumption and Nutrition Division (FCND). FCND examines how policies, programs, and institutions affect the nutrition and food security of nations, communities, households, and individuals.*

BREEDING THE SEEDS OF HEALTH

Until about 20 years ago, getting enough to eat was the top priority for hungry people and their advocates. The micronutrient density of food seemed less urgent than consuming a sufficient number of calories. Though anemia, goiter, visual impairment, and other clinical results of vitamin and mineral deficiencies have long been recognized by the medical community, the extent of

the more insidious health consequences of chronic micronutrient deprivation—compromised immune function, impaired cognitive development, stunted growth, reproductive problems, reduced longevity, and low work productivity—was not well understood. But a 1986 Johns Hopkins University study by Alfred Sommer and colleagues of vitamin-A deficiency in Indonesia made it clear that protein-energy deficits were only one part of nutrition-based public health problems in the developing world.

“This study of 20,000 school children demonstrated for the very first time something that had not been known before: Vitamin A’s importance goes well beyond eye health. Half the children received a six-month supply of Vitamin A in capsules, the other half got a placebo,” says Howarth Bouis, IFPRI senior research fellow and organizer and director of the CGIAR

Micronutrients Project. “The great surprise was that the mortality rate of the children who received vitamin A supplements fell by 30 percent compared to the children who did not. The results of the experiment were replicated in other places, though the average drop in mortality rate was less spectacular at 23 percent. This expanded the focus of the nutrition and public health communities from dietary quantity to dietary quality.”

Evidence grew that vitamin-A, iron, iodine, zinc, and other micronutrient deficits condemned hundreds of millions of people to poor health and early death. The number of people suffering from the effects of micronutrient deficiencies far exceeded those estimated to be stunted and underweight. The public health community intervened by iodizing salt and providing supplements for vitamin A and iron.

“But it isn’t that simple,” Bouis says. Supplementation and fortification involve recurrent costs year after year in country after country and so are expensive in the long term. Moreover, these interventions cannot reach everybody. So Bouis sought a solution in agriculture.



“What about making food itself denser in micronutrients?” he asked. “If the rice plant could take iron from the soil and put it into the seed,” Bouis reasoned, “then all you’d have to do is breed it for micronutrient density and the rice would be fortified forever. This could be done using traditional or transgenic breeding methods. For the one-time cost of

research at a single central location, you could spread those benefits throughout the world.”

Bringing the nutrition, public health, and agricultural science communities together required persuasion. “Plant breeders think about plant, not human, nutrition,” Bouis found as he traveled from one CGIAR center to another promoting the idea. “At first, scientists resisted adding improved human nutrition as a breeding objective. They believed it would lower yields, so farmers would not grow the more nutritious varieties. But collaborative research at the Waite Agricultural Research Institute at the University of Adelaide in Australia, and the Plant, Soil, and Nutrition Laboratory of the U.S. Department of Agriculture’s Agriculture/Research Service at Cornell University showed that no trade-off between yield and human nutrition existed. In fact, this team of scientists studying the relationship between trace minerals in soil, plants, and humans found that loading more trace minerals in seeds actually increased yields. It looked as if what was good for plant nutrition was also good for human nutrition.”

A study by Bouis and colleagues provides the first published population-based estimate linking diet and prevalence of anemia. Based on repeated 24-hour recalls of their food intake by poor, rural Bangladeshi women and repeated measures of their blood hemoglobin, the study allowed researchers to compare the benefits of biofortification, better diet, and supplementation to reduce anemia. They found that doubling the iron in rice through plant breeding at a cost of US\$0.03 per person per year would have the same effect on the women's blood hemoglobin as an increase in meat consumption costing US\$35 per person per year. Iron supplements costing US\$2 per person per year would increase blood hemoglobin by a factor 3.5 times that of doubling the iron in rice, but at 50 times the cost. This suggests that a high percentage of those suffering from relatively mild anemia could be moved out of iron deficiency through biofortification at low cost, while those severely anemic could be targeted for more expensive supplements.

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"But we need to do a human feeding study to demonstrate efficacy definitively, to show that the extra iron is absorbed and improves the iron status of a deficient population," Bouis says. "So with our partners at the University of the Philippines, Los Baños, we hit upon the idea of doing the study in convents. Because everyone eats from the same kitchen day in and day out, it is easy to control for diet. We are trying to find 15 convents with high prevalence of iron deficiency so that we can start the feeding studies this June. The nuns in the convents will eat the

biofortified rice for nine months, and then we'll repeat the blood tests. We hope to get a significant improvement from the high-iron rice."

Meanwhile, to share research findings and strengthen the newly forged link between agriculture and nutrition, the Food Consumption and Nutrition Division is publishing *Seeds of Health*. The first issue of

this newsletter, to be issued three times a year, is now available on IFPRI's website.

RESPONDING TO URBAN CHALLENGES

Poverty alleviation programs in urban areas are often seen as far more complicated than rural development efforts. But as IFPRI evaluations of several CARE projects reveal, many common assumptions about urban areas upon which this belief is based simply aren't true. IFPRI research fellow James Garrett calls these beliefs the "urban myths" of the development community.

"In rural areas, development is all about agriculture," Garrett says, "and development agencies can deal with that. But problems in urban areas seem overwhelming. They're not. They are complex, but they respond to the right intervention. Programs can accomplish a lot by focusing on just one thing, and doing it well. When development agencies undertake integrated needs assessments and analyses, they can design programs that address the actual needs of the community, and can identify critical constraints as well. From there, it's a matter of engaging the government

and communities as partners or allies and building community trust in the program through honesty, political impartiality, and transparency.”

Another urban myth is that heterogeneous city communities lack strong social structure and cohesion. In reality, urban networks are different but not necessarily inferior to those in rural areas, which have their weaknesses too. For example, community sanctions for violating cultural norms and values may be stronger in the countryside, discouraging individuals from participating in a project because it appears to be outside the narrow bounds of convention. Though city dwellers do have ethnic and kinship ties, they also have many other relationships that are not contained geographically or socially. City folks may participate in organizations within or outside their neighborhoods formed around politics, religion, employment, social welfare (food subsidies, mothers’ clubs, housing), athletics, and even crime.

The very independence, diversity, and mobility enjoyed by urbanites exposes them to new ideas and creates awareness that can work in favor of adopting new approaches to old problems. IFPRI’s assessment of CARE’s urban programs shows that they have been successful because they tapped into existing social networks and the many NGOs already working in the neighborhoods. CARE fosters the formation of permanent new networks during the process of planning and

implementing its programs. Workers in both CARE’s food-for-work project in Ethiopia, which built roads in the capital’s poorest neighborhoods, and in its food project in Lima, Peru, which created community kitchens, remarked that the projects reinforced the social cohesion already present in these communities, which itself contributed to the success of the projects.

IFPRI’s evaluation of CARE’s Peru and Ethiopia projects also shows that development organizations can work effectively in potentially troublesome political situations. IFPRI found that CARE kept government authorities at all levels involved and informed while building the food-for-work program in Addis Ababa. By creating legal agreements that clearly delineated institutional roles, responsibilities, and commitments among stakeholders at the very beginning, CARE allowed stakeholders to feel ownership of the project and minimized the potential for destructive interference.

CARE’s short-term goal in Addis Ababa was to build roads to help poor people weather seasonal changes, to provide employment and temporary livelihoods to the very poor, and to improve nutrition by paying workers the equivalent in food of slightly less than the going wage. In this way, only the very poorest and hardest to employ applied, a built-in self-selection mechanism that proved very effective at targeting the intended population.



Members of the community told IFPRI interviewers that the benefits of paved roads to the community were immediate. Residents no longer had to slog through knee-high mud during the rainy season or risk treacherous footing on slippery slopes. Many residents reported that they were able to leave their homes at night for the first time in years, and that ambulances, firefighters, and electricity and telephone repair crews could finally reach them. Drainage ditches prevented flooding and latrines improved sanitation and health. “Children used to have problems with vomiting and dysentery,” according to those interviewed. “But not now. And it doesn’t smell.”

At the household level, food availability improved the standard of living of workers’ families. At the personal level, the food-for-work program was nothing short of life transforming for women, who comprised 60 percent of the workforce. It expanded their self-concept and boosted their self-esteem. The project “brought drastic change in the mentality regarding women’s roles among all the women and some men,” according to Garrett’s research. Women began to see themselves as competent providers and capable workers, doing a job many had believed only a man could do. “The project personalized that understanding for women workers, truly empowering them,” Garrett says. “In fact, women became ‘preferred’ workers because supervisors often felt that women worked harder and were more responsible than men.”

Work outside the home empowered women within the home. Those who held jobs usually determined how the food was distributed within the household. This gave women workers the greatest say in how to use the income they earned from selling part of the food they received as payment for work. Mothers bought clothing or household goods, paid for their rent and their children’s education fees, and bought a variety of additional foods.

CARE’s Lima, Peru, food program in support of *comedores* (community kitchens) conferred an array of material and empowerment benefits on participants, all of whom were women. This program, PRODIA (Proyecto de Desarrollo Integral con Apoyo Alimentario/Integrated Development and Food Assistance Project), grew out of earlier government-supported feeding programs in communities where women already had considerable experience working together.

The macroeconomic shocks of the Fujimori government in the early 1990s made *comedores* an essential means of survival for poor families, saving many from hunger. The number of members in each *comedor* varies between 30 and 80. Most are housewives from the surrounding neighborhood with limited work experience outside the community. PRODIA gives each member a basket of rice, soy oil, and dry milk. The *comedor* buys other foods to make complete meals, and the members cook the food and sell it for less than an individual household could prepare it. In return for her labor, each member receives a certain number of free or reduced-price meals.

There are many other benefits beyond food. Members can access credit, earn additional income, acquire management and administrative skills, and learn about nutrition. Their self-esteem improves along with their ability to make decisions freely. “We learned to defend ourselves,” one woman said. “No one had any reason to be humiliated anymore. Before, the women didn’t speak, they didn’t have an opinion, they didn’t protest. Now even the most humble one knows what her rights are. She respects others and others respect her.”

The esteem women feel through their work in the *comedores* translates into greater authority within the home as well. Many women told stories of how their husbands protested, or even beat them, when

they first began to work at the *comedor*. But they gained moral support from friends, coworkers, and CARE staff, who comprise a family away from home. While the focus of the *comedor* is hunger relief, arguably the greatest gain comes from the increased knowledge, managerial capacity, and empowerment of women. Though members come and go according to need, a core group of women stays to provide continuity and exercise leadership in the community.

High urbanization rates in Latin America have been accompanied by an increase in women's participation in the labor force and the number of households headed by single mothers. The *Hogares Comunitarios* (community daycare) program, established in Guatemala City in 1991 by the national government of Guatemala as a direct response to the need of poor working mothers for substitute childcare, was designed to alleviate poverty by providing low-cost, quality, community-based daycare. The program aims to help young, low-income, single mothers retain steady employment while improving the nutritional status of children.

To create a daycare center close to home, up to 10 families get together and elect a mother from the community who agrees to become the "caregiver mother." This mother then hosts up to 10 children in her home from Monday to Friday, 12 hours per day. When a community daycare center is formed, the government provides supplies and equipment for the children, as well as training for the future caregiver mother. In addition, the pro-

High urbanization rates in Latin America have been accompanied by an increase in women's participation in the labor force.

gram pays about US\$0.55 per child for the caregiver to purchase food for two meals and two snacks per day. The program also pays caregiver mothers US\$3.33 per month for each child she looks after. The parents of beneficiary children complement this amount with \$5 per child per month.

"The beauty of this program is that it reaches

the very poorest women and allows them to work in the formal rather than the informal sector," senior research fellow Marie Ruel explains. "More than 70 percent of the moms participating in the program in Guatemala City work in factories (*maquilas*). Although the conditions in *maquilas* have been subject to harsh criticism, this type of work offers more stable employment to mothers as well as benefits such as health insurance, social security, and vacation, which simply do not exist in the informal economy."

"When we compared the children in the daycare homes to a control group of those who were not in the program," Ruel says, "we found a positive impact on the children's nutritional status. The diets of children in daycare were higher in calories as well as important micronutrients like iron and vitamin A. But the benefits to children and mothers of *hogares comunitarios* extend well beyond improved nutrition, especially in terms of socialization. Guatemala City's poor neighborhoods are rough and often violent, and parents fear for their children's safety. Many children not in the program are locked in their homes while their mothers work. Children as young as five years old have to feed themselves, eating cold

food their mothers leave on the stove. Siblings, who may be just a few years older than the children in their charge, take care of younger brothers and sisters. These older children are not allowed to go to school because of their childcare responsibilities.”

Despite its many benefits to participants of all ages, the program has some problems, Ruel admits. The houses in these poor neighborhoods are precarious. Sometimes hygiene is poor and dangerous objects are found in the rooms where children play. Beneficiary parents said that the program could be improved by extending its days of operation to Saturdays because most parents work at least half the day. Care for infants less than one year of age is also a concern, because the program does not allow more than one young infant per daycare center. Many parents of young infants, especially single mothers, are left with no way to provide care for their babies during their first year of life.

Finally, parents and caregiver mothers said that establishing links with health care facilities would strengthen the program. Many children come sick to the daycare center because their parents risk losing their job if they are absent for more than one day a month. Caregiver mothers cannot leave their homes—and the other children—to take a sick

child to a clinic. As a result, contagious diseases spread very quickly within the daycare centers.

The new administration that took power in 2001 has heeded these concerns and has implemented many of the measures recommended in Ruel’s evaluation report. This program fills a great need for alternative child care among poor working parents and can significantly contribute to the reduction of poverty and food insecurity in urban slums.

STRENGTHENING THE HAND THAT FEEDS YOU

Food security, like charity, begins at home. But traditional patriarchal families are not equal opportunity environments. To the contrary, in many cultures, the lives of women and girls are determined within the family by fathers, husbands, and brothers; by tribal customs that favor men; and by conservative religious beliefs that subjugate women. Though women throughout the developing world are responsible for raising most of the food their families eat, they face many constraints to fulfilling their roles as food producers and caretakers of their families’ food and nutrition security. Gender differences in control over resources affect the welfare of boys and girls within the household. In rural Bangladesh, for example, where fathers hold the vast majority



of household assets, boys have better short- and long-term nutritional outcomes. When mothers hold a higher percentage of assets, these same outcomes improve for girls.

Empowering Women to Achieve Food Security (Focus 6), a series of briefs prepared for the 2020 Vision conference in Bonn, Germany, underscores the importance of increasing women's human, physical, financial, social, and political capital in order to end hunger and malnutrition. At IFPRI and elsewhere, study after study shows that inequity between women and men affects every sphere of human endeavor. Gender differences in property rights hinder natural resource management and make it difficult for rural women to have stable livelihoods. In Egypt and Mozambique, increasing women's human capital reduces poverty. There is also evidence that increasing women's assets raises household investments in education and girls' health. Improvements in women's education and status accounted for more than 50 percent of the reduction in child malnutrition in the developing world between 1970 and 1995. Females in South Asia consistently suffer worse health than males, who receive preferential preventive care, while girls in Sub-Saharan Africa tend to do better than boys.

New IFPRI research suggests that the so-called Asian enigma—the fact that child malnutrition is so much higher in South Asia than in Sub-Saharan Africa when South Asia is doing so much better for most of the long-accepted determinants of child nutritional status—is partly due to women's low status. In many regions, severe restrictions on women's freedom and autonomy both within the home and in public life take a heavy toll on children. In 2001, research fellow Lisa Smith, Food Consumption and Nutrition Division director Lawrence Haddad, and their Emory University collaborators completed a study that establishes a clear link between women's status and child nutrition.

Using demographic and health survey data from 36 developing countries, the researchers sought answers to two main questions: Does the status of women affect child nutrition in South Asia, Sub-Saharan Africa, and Latin America and the Caribbean? And how does women's status operate to improve child nutrition?

“We've actually been able to show that the low status of women in many Asian countries affects babies' nutritional well-being,” Smith says. She is careful to distinguish between women's health, an important factor in child survival, and women's status, “which refers to women's power relative to men in the households, communities, and nations in which they live. Power is the ability to make choices for oneself and one's family,” she says. “When women's power relative to men is low, they have less control of their own time and household income; their time constraints are tighter and they lack social supports; their knowledge and beliefs are limited due to less exposure to education and information; their mental health, confidence, and self-esteem suffer; their autonomy and freedom of movement may be circumscribed; and their access to female-specific health services may be inadequate.”

The researchers constructed an index of women's decisionmaking power relative to their husbands', including household-level data on whether women work for cash, their age at marriage, and the age and educational differences between them and their husbands. But whatever women's power relative to men within the household, women may also encounter various barriers outside the home: fewer work opportunities, lower wages, and a narrower range of acceptable behavior. For this reason, the researchers also included a community-level measure of women's status.

It is well known that women's health and nutrition directly affect the health and nutrition of children. Poor prenatal maternal nutrition leads

to low birth weight, which is the single most important predictor of child survival. Maternal micronutrient malnutrition during pregnancy affects the pre- and post-natal health of the child. The researchers found that focusing on children alone does not end child malnutrition because it does not address the entire life cycle of poverty. Without care for women themselves, children suffer as much as women do.

“Women’s nutrition affects their energy levels and their ability to breastfeed and carry out essential child care,” Smith says. “Care for women, including prenatal and birthing care, is an important pathway through which women’s status affects child nutrition. Although women with lower status tend to breastfeed more, the food they give their children is of lower quality, the timing and frequency of feedings is not optimal for normal child development, and the health-seeking practices on behalf of children are curtailed. If a woman can’t leave the house, she can’t immunize or get medical care for her children.”

It has been common for programs that combat child malnutrition to target children. But the research of Smith and her colleagues suggests that in regions where women’s status is low, the impacts of programs to improve care practices for children, such as child feeding, would be more effective and sustainable when combined with efforts to improve women’s status. Smith presented these findings on the Asian enigma at the International Union of Nutritional Sciences in Vienna, Austria, in August 2001.

Poor prenatal maternal nutrition leads to low birth weight, which is the single most important predictor of child survival.

LAND INHERITANCE

By law and tradition, only men have had the right to own or inherit land in many African societies, despite the fact that women play a major role in food production in Africa. These gender disparities in property and land-use rights have serious consequences for nutrition as well as management of natural

resources, since farmers with long-term access to land have the greatest incentive to sustain and develop it. Fortunately, neither tradition nor law is as intransigent as was previously believed.

Property rights in Ghana are evolving, and the changes bode well for women. Traditionally, land has been communally owned. To lay claim to a piece of land, people clear the forest on it. Strong rights to the cleared land are awarded to those who perform this difficult, intensive work, generally men. Both women and men work the farm, but under the Akan matrilineal system, if a husband dies, his male relatives, not his wife and children, would likely inherit his property. A man could neither sell the land, nor transfer land rights to his wife. To create greater security for widows and children, a 1985 law established a new inheritance system by which a widow would receive one-third of her husband’s property, her children would receive one-third, and the husband’s family would receive one-third.

But changing inheritance law is only half the solution to ensuring land rights for women, cautions IFPRI senior research fellow Agnes Quisumbing, who studies gender, physical-asset

allocation, and investment in human capital in a number of very different cultures. “Changing customary law and practice are just as important. We tend to think of traditional institutions as immutable,” she says. “But they’re not. Traditions evolve, and these changes can be used to help people move out of poverty.”

Under Ghana’s customary land rights system, once land is cleared, individuals can strengthen their rights to it by planting trees. Building on this customary practice, women in the cocoa-growing regions of Ghana have harnessed tradition, by using “gift” transfers to acquire their own private rights to land independently, in addition to whatever they might inherit from their husbands. Wives acquire land as a gift with strong individualized rights in return for their work to establish cocoa farms. But men can obtain land as a gift when they plant 20 to 25 percent of a parcel with cocoa trees; women have to plant 40 to 50 percent of the parcel with trees before it can be transferred to them as a gift. Though men clearly still have the advantage, the emergence of gift transfers has strengthened women’s rights. Once land is given to a woman, no other family member can reclaim it, including her husband. Women are also entitled to a portion of the land they help plant with cocoa, should their marriages end in divorce.

Cultivating cocoa provides women with a more secure way to gain land rights, and greater economic security. “The demand for cocoa, a major cash crop, has increased the demand for women’s labor and increased their incomes,” according to Quisumbing. “When cocoa trees are young, they are planted simultaneously with and among the food crops, which are considered the responsibility of women. As the trees become tall, they begin to shade the food crops, so new areas must be opened so the food crops can flourish. Cocoa

farms are established little by little in this way, often emerging from the family food plots that are women’s domain.”

Cocoa is particularly good for female farmers, who are as productive as men when they have equal access to inputs such as fertilizer and credit. Central to Quisumbing’s research is her conviction that land inheritance cannot be viewed in isolation from other forms of inheritance. “Traditional land tenure systems are changing, so we wanted to see if the distribution of education was changing too. It’s important to look at both physical assets and human capital as instruments for moving out of poverty. Both are a form of inheritance, and it’s much easier to change human capital than land tenure systems.”

“In Ghana, where land is held by men, changing land inheritance makes a big difference in improving women’s livelihoods, in part because women have been so disadvantaged in the past. Land rights in rural Ghana are somewhat more important to women than education because there are few off-farm job opportunities. This means that more schooling, generally the key to improving the quality of life for women and their families, does not necessarily increase a woman’s income in this setting, although it still confers the many other benefits that come from education.”

In addition to Ghana, Quisumbing also conducted studies in the Philippines, where both women and men inherit property, and in Sumatra, Indonesia, an extremely egalitarian matrilineal culture where women traditionally hold the rights to paddy land, and daughters inherit land directly from their mothers and grandmothers. Sumatran men have other forms of income from trading and artisanal activities, but traditionally do not inherit any land. Rather, they work on their wives’ family farms.

With the adoption of agroforestry, which requires male labor, land inheritance in Sumatra is becoming more equal. Men are now inheriting agroforestry land that they have cleared and planted with cash crops. This does not lead to a big change in the relative incomes of men and women because they were more equal to begin with. The gender gap in education has also narrowed, a welcome change since education had always favored men in Sumatra. Since agriculture cannot be expected to absorb a growing labor force, education is key to finding jobs in the nonfarm sector.

Among rice farmers in the Philippines, “Sons are inheriting more land than daughters, while daughters are getting, on average, one and a half more years of education than sons,” Quisumbing says. This adaptation makes sense, “because boys earn more money in rice farming than they could off the farm, and with more years of schooling, girls earn much more in factories or as nurses and domestic workers than they could on the farm. When Philippine women work in the cities or outside the country, their remittances help support the entire family. In fact, the family’s potential income over its lifetime would be less if it gave sons and daughters equal amounts of land and years of schooling.”

BUILDING HUMAN CAPITAL TO BREAK THE CYCLE OF POVERTY

Bangladesh’s Food for Schooling program is one of the country’s most successful efforts to improve the lives of its desperately poor citizens. Many children in Bangladesh do not attend school, either because their families cannot afford expenses such as books and supplies, or because the children contribute to the family’s livelihood and cannot be spared. Under the Food for Schooling program, poor families receive a free monthly ration of foodgrains in exchange for sending a child to school. The family can consume the grain, thus reducing its food budget, or sell the grain and use the cash to meet other expenses. Begun in 1993, this program covered 17,811 public and private primary schools by 2000, accounting for 27 percent of all primary schools in the country. About 2 million families benefit from the Food for Schooling program.

IFPRI senior research fellow Akhter Ahmed and research fellow Carlo del Ninno have worked with Bangladesh officials for years to design and evaluate antipoverty programs. An IFPRI evaluation they completed in 2001 revealed that Food



for Schooling has increased primary school enrollment, promoted school attendance, and reduced dropout rates. Student enrollment rose by 44 percent for girls and 28 percent for boys in schools that adopted the program. “These results are remarkable,” says Ahmed, the lead researcher on this project. “By reducing illiteracy, educating girls, and channeling resources into very poor families, Food for Schooling can help address long-term causes of hunger and poverty.”

Food for Schooling can be part of a more comprehensive Food for Education program, which also includes school feeding (children eat in school). While both approaches use food to enhance the educational attainment of children, school feeding’s primary objective is to provide meals in order to increase children’s learning capability in the classroom. In contrast, Food for Schooling aims to motivate families to send their children to school and to reduce food shortages within the household.

“A Food for Education program that combines school feeding and free food to families accomplishes three things,” Ahmed says. “It attracts children to school, helps children learn by eliminating short-term hunger while they are in the classroom, and reduces chronic hunger and malnutrition for the whole family. We have recommended a Food for Education program that combines Food for Schooling with school feeding. Together, these programs can be a powerful tool to create opportunities for families to educate their children and incentives to keep them in school.”

Food for Education effectively targets poor households and improves household food security, significantly raising calorie and protein consumption.

The evaluation shows that Food for Education effectively targets poor households and improves household food security, significantly raising calorie and protein consumption. But there is room for improvement. “Leakage became a serious problem after the government shifted the responsibility for food distribution from the school committee, whose teachers and headmasters

complained that it took too much of their time, to private dealers, who often divert the grains to the black market for extra profit,” Ahmed says. In the household survey, 71 percent of beneficiaries reported that they received far less from dealers than their entitlements. “We have recommended that all beneficiaries be required to convene at the local school on a set day each month to collect their ration. This would establish a sense of group solidarity among recipients, clarify the exact amount to which they are entitled, and facilitate collective action against pilferage when it occurs,” Ahmed says.

The geographic targeting of villages in Food for Education programs is generally effective, the study found, but within those villages, targeting could be improved. A considerable number of poor households remain excluded from the program, even while many nonpoor households are included. There are still eligible households in Food for Education villages with primary school-age children who are not attending school at all. “A means test similar to those IFPRI has developed to measure household welfare in other countries could be used in Bangladesh to improve targeting. And Food for Education should be

broadened to include a preschool feeding program. Preschool malnutrition is associated with delayed enrollment and poor health and cognitive development. The Food for Education program could be adapted to help younger children by providing both food-grains and nutrient-dense complementary foods to preschool-age children in participating households.”



frequent healthcare, and learning that the future can look quite different from the past. Participation in PROGRESA is contingent on income eligibility, school attendance, and visits to healthcare facilities.

“For the vast majority of Mexicans, public welfare has been marred by generations of unequal accumulation of wealth and

The Food for Schooling program has been so successful at increasing school enrollments that participating schools face serious overcrowding. “The quality of education, as measured by standard achievement tests, is somewhat lower for program participants, but that is due to factors outside the program, such as illiterate parents, malnutrition, and inadequate facilities, not to more crowded classrooms,” according to Ahmed. “We recommend assistance to help communities build more schools, improve school facilities, hire more and better qualified teachers, and provide teacher training,” Ahmed says.

So successful is Mexico’s PROGRESA anti-poverty program that in January 2002, the Inter-American Development Bank approved a US\$1 billion loan to expand it. PROGRESA—the apt acronym stands for Programa Nacional de Educación, Salud y Alimentación—provides education, health, and nutrition aid to millions of indigent families, demonstrating definitively that anti-poverty interventions can work, and quickly. In just three years, children in rural families targeted by PROGRESA are attending school longer, eating more diversified diets, receiving more

opportunity,” according to IFPRI senior research fellow Emmanuel Skoufias. “Unlike previous social programs, PROGRESA offers a unique package of cash transfers, in-kind health benefits, and nutritional supplements. And the program distributes benefits directly to mothers in order to improve the welfare of poor rural families.”

The deliberate decision to direct cash transfers only to mothers is motivated by growing evidence that when women control household resources, children’s health and nutrition improve. Research has also found that the more women control resources, the higher their bargaining power within the family, which has a positive effect on children’s, particularly girls’, education and future livelihoods.

“By rigorously evaluating PROGRESA’s approach, we hope to identify key elements and mechanisms in breaking the cycle of poverty,” Skoufias says. IFPRI researchers and their PROGRESA colleagues analyzed the impact of the program on education, health, and nutrition, as well as on women’s status and work incentives. The research team collected household-level

data from 24,000 households in 506 localities. Focus groups and workshops with beneficiaries, local leaders, PROGRESA officials, health clinic workers, and school teachers yielded an in-depth understanding that supplemented quantitative household survey information.

IFPRI found that PROGRESA's household targeting is good. The program has been implemented in localities where poor households are most likely to be found, and has reached the poorest households within them. However, in highly marginalized and isolated communities, research indicates that the benefit of household targeting can be very small. In essence, where all are poor, targeting involves giving benefits to the entire community. More specific targeting may not be necessary.

Educational results are encouraging. "Children will have an average 0.7 year of extra schooling because of PROGRESA," Skoufias reports. "The research suggests that PROGRESA's educational benefits can raise children's lifetime earnings by 8 percent." IFPRI found that PROGRESA students are entering school at earlier ages, experiencing less grade repetition, progressing better from grade to grade, and dropping out at lower rates. The program has been especially effective in reducing dropout rates during the critical transi-

*PROGRESA is
proving to be
effective in breaking
the intergenerational
transmission
of poverty.*

tion from primary to secondary school, when many poor children leave to contribute to the household's income.

PROGRESA's impact on health, household food consumption, and nutrition are striking for both children and adults. Participating children have a 12 percent lower incidence of illness, and sick or disability days among adults have

decreased 19 percent. Recipients significantly increased visits to clinics for nutrition monitoring, immunizations, and prenatal care. At home, PROGRESA families are consistently consuming more calories and eating a varied diet that includes more fruits, vegetables, and meat—all important sources of the essential vitamins and minerals that shape physical and mental development. The results show a significant reduction in the probability of stunting for children aged 12 to 36 months.

PROGRESA's combination of education, health, and nutrition in one integrated package is working. "Our research shows that PROGRESA's influence on the lives of children in poor households today will positively reinforce their school attendance, performance, and life attainment tomorrow," Skoufias says. "PROGRESA is proving to be effective in breaking the intergenerational transmission of poverty."

MARKETS AND STRUCTURAL STUDIES

Agricultural markets are often very risky in the developing world and imperfect institutions and infrastructure can distort these markets. The Markets and Structural Studies Division (MSSD) seeks to harness market changes so that they contribute to agricultural growth, alleviate poverty, and improve food security for the world's poorest and hungriest people. "As rural economies move from subsistence to commercial agriculture and national economies open their markets, many poor people have experienced additional hardship. We have to enable poor farmers to diversify what they produce and use state-of-the-art marketing techniques to compete in regional, national, and global markets," says Markets and Structural Studies Division director Ashok Gulati. Policy changes can help cut transaction costs so that producers earn more while consumers pay less. MSSD analyzes how developing markets and supporting infrastructure and institutions can guide these transformations for the benefit of all.

HARNESSING MARKETS FOR FOOD SECURITY

Bangladesh

Like many developing countries, Bangladesh faces the challenge of how to increase domestic food production and rural incomes, ensure that the poorest people have enough to eat, and mitigate the adverse effects of natural disasters. Since the mid-1970s, the country has more than doubled its production of rice and wheat, improved its infrastructure, made food delivery to the poor more efficient, and liberalized its markets. IFPRI research on rice procurement, rice imports, maize production and marketing, price stabilization, private sector trade, household food security, and

developments in the livestock and poultry sectors has helped the government of Bangladesh find and refine solutions to these problems.

IFPRI senior research fellow Paul Dorosh and research fellow Carlo del Ninno were stationed in Bangladesh from 1997 to 2001 as part of a long-term USAID-funded Food Management and Research Support Project (FRMSP) to train senior officials in food policy analysis and provide relevant, research-based advisory services to the government. Dorosh and del Ninno's review of the government response to the 1998 flood, published as Research Report 122, shows that the country's trade liberalization of the early 1990s made a major contribution to national food secu-

rity during the crisis and that government transfers of food immediately following the flood reached flood-affected households.

The 1998 Bangladesh flood illustrates the crucial role that private markets and appropriate government investments and policies can play in maintaining food availability, limiting price increases, and supplementing household access to food, even after a major natural disaster. Following poor *aman* rice harvests in late 1997 and 1998, private-sector imports from India added more than 2 million metric tons to Bangladesh's rice supply. These imports helped keep down domestic food prices in a time of shortage and avoid a food emergency.

"Private-sector rice imports from India kept domestic rice prices at least 20 percent lower than they would have been in the absence of these imports, preventing the total calorie consumption of poor people from falling by 100 to 150 calories per person per day," Dorosh says. "Following the flood, it wasn't possible for the government to import enough rice quickly and affordably. Instead, the government maintained incentives for the private sector to import rice, a policy that had been pretested on a lesser scale after the rice shortfall of 1997. This same policy worked in 1998, when the shortfall was even larger, by eliminating the import tariff, expediting customs procedures, and guaranteeing that government sales of rice would not destroy private-sector market incentives."



Government policy also helped ease food insecurity through short-term food distribution to flood-affected households. Longer-term policies were important as well. Agricultural and investment policies allowed for an expansion of the winter season (*boro*) rice crop that reduced the country's dependence on the flood-susceptible, monsoon-season (*aman*) rice crop.

By investing in infrastructure and promoting private-sector trade, the government fostered development of efficient and competitive food-grain markets that quickly responded to the looming food shortage.

IFPRI has collaborated with the government of Bangladesh for many years on research that formed the scientific basis for IFPRI's policy advice to decisionmakers, who in turn pointed to areas where more research was needed. Training senior officials in food policy analysis helped develop the country's long-term capacity to deal with food issues. In addition, the government needed "just in time," practical policy analysis. IFPRI staff worked with the government's Food Planning and Monitoring Unit to write 53 policy advisory memos over four years, most in response to direct requests for immediate analysis from the Ministry of Food. These memos offered ready input to current policy decisions, and many of the issues discussed in them became topics of subsequent research.

South Asia Initiative

South Asia, with the largest concentration of poverty on earth, offers a major challenge to policymakers, planners, and analysts. Though South Asia generates less than 2 percent of world income, 22 percent of the world's people and 44 percent of people who earn less than US\$1 a day live there. Sixty percent of the South Asian labor force is involved in agriculture, which accounts for about 25 percent of GDP for countries of the region.

IFPRI's new South Asia Initiative (SAI) addresses important agricultural issues, such as irrigation, water scarcity, market reforms, the effects of globalization on institutions and infrastructure, environmental sustainability, and urbanization. Ashok Gulati, director of the Markets and Structural Studies Division, and Suresh Babu, head of the Communications Division's Training for Capacity Strengthening Program, are leading this multi-divisional effort.

The SAI established the Policy Analysis and Advisory Network for South Asia (PAANSA) to foster effective bottom-up policy dialogue on food security and poverty alleviation. Applied research will focus on critical policy issues facing the region's food, agriculture, and natural-resource sectors. Local capacity will be developed through collaborative research, training, and exchange programs with local institutions, NGOs, and the private sector.

IFPRI has worked extensively with policy institutions in Bangladesh, India, and Pakistan over the past 25 years. The SAI will expand IFPRI's work in the region to include Bhutan, Maldives, Nepal, and Sri Lanka.

Beginning in August 1998, the flood dominated the policy agenda for nearly a year. Memos during this period covered food-aid requirements, assessments of market behavior, options for stock management, procurement and distribution, expansion of the Vulnerable Group Feeding Program, and other issues. The project team helped prepare a major report on comprehensive food security in Bangladesh and a draft National Food Policy in 2001, a document that went beyond discussions of the "food gap" and food-aid requirements to include food availability, people's access to food, and their ability to utilize food for good nutrition. The Food Planning and Monitoring Unit, the Ministry of Food, and other ministries recast the policy framework as a National Food Policy statement, which was approved by a bipartisan parliamentary committee in 2001 but not officially adopted before the Awami-led government stepped down that year.

Training Bangladeshi personnel to conduct food policy research and formulate policy based on it was an ongoing part of the project, and was designed to build skills and expertise that would serve Bangladesh for years to come. Nearly 300 people participated in training in Bangladesh, including instruction on how to use computers for food policy analysis. Government officials also joined three study tours to the U.S. and three to Asia.

Did the project's training component help the government of Bangladesh come any closer to its overarching goal of greater food security? Given the complex nature of the policy process and the long lead time involved in policy shifts, it is often difficult to pinpoint the effects of various training and research activities. Nevertheless, it seems likely that the project laid the groundwork for sound research and policy actions in the future.

Ethiopian Grain Markets

Macroeconomic market reforms in Ethiopia in the 1990s lifted all restrictions on private interregional trade, removed official pricing and quotas, and eliminated the marketing board monopoly. But despite liberalization, only 28 percent of total cereals production reaches the market and only 18 percent passes through the marketing chain.

To find out why macro reforms had such limited effect, IFPRI research fellow Eleni Gabre-Madhin conducted a survey of micro market institutions, transaction costs, and social capital in the Ethiopian grain market. In the process, she noticed that all the

traders seemed to do business in just one market, usually one nearby. What was stopping them from trading in other parts of the country where there were food shortages and where they might get a better price for their grain?

“Abdu Awol was the exception to the rule,” Gabre-Madhin said of the grain trader whose risky experiment reveals many of the underlying problems that confront grain traders at the micro level. He transported maize 900 kilometers across three regions to northern Ethiopia where he heard prices were higher. It took him two and a half weeks to get there. Along the way, he was stopped at least 10 times by road officials, whom he had to bribe.

Traders rely on personalized trade for a significant share of their transactions. Since Abdu had no such contacts in the new region and since there were no national standards by which grain could be graded and certified, potential customers were a hard sell. When Abdu did his balance sheet, he realized that he’d lost money. He had had to accompany his goods, which took time. And on top of all his transport expenses and transaction costs, he had had to sell at a loss. He wouldn’t do it again, he said.

“This experience explains how it happens that people go hungry, even when we have food surpluses in Ethiopia. The costs and risks of trade are still high, and that limits food availability and raises the price of food in food-deficit areas,” Gabre-Madhin says. “But traders are locked into short-distance transactions. Despite price incentives, they can’t capture those benefits.”

Gabre-Madhin’s analysis of trader behavior, described at length in Research Report 124, reveals that Ethiopian grain wholesalers are generally small-scale, personalized enterprises. Traders’ arbitrage activity is mainly limited to transport,

with an average transported distance of 200 kilometers. Weak public market information, the lack of grain standardization, the oral nature of contracts, and limited legal enforcement of contracts increase the risk of commitment failure.

In response, traders either choose partners they know well or they engage a broker. Brokers facilitate anonymous exchange between traders, who are constrained by the opportunity costs of searching for buyers and of holding capital fixed during the search. The transaction costs of finding a buyer and coordinating the transfer of goods are significant, representing 19 percent of total marketing and transaction costs. However, while 85 percent of traders use brokers regularly, they do so for only one-quarter of their total transactions and 33 to 55 percent of their long-distance transactions. This study demonstrates how, in the context of Ethiopia’s weak marketing environment, the institution of brokerage minimizes transaction costs and facilitates exchange. It also reveals the limitations of the brokerage institution.

How can people like Abdu Awol be encouraged to trade and transport grain to more distant markets? The solution, according to Gabre-Madhin, lies in genuinely competitive prices, uniform product certification, coordinated national market institutions such as grain auctions and exchanges that bring buyers and sellers together, and regulatory institutions that can enforce contracts.

IMPROVING SMALL-FARMER ACCESS TO HIGH-VALUE MARKETS

The market for livestock, dairy products, fish, fruits, vegetables, spices, and ornamentals is growing faster than any other sector in world agriculture, with most of that growth occurring in the developing world. If small farmers in poor

countries could compete in these specialized markets, they would increase their incomes considerably, lifting themselves and their families out of poverty and food insecurity. Instead, many are being pushed out by larger-scale farms and agro-industries whose presumed efficiency and economies of scale lower their cost per unit and make them more profitable. But are the competitive advantages

enjoyed by larger-scale farms and processing businesses really due to better knowledge and management? Is it that smaller farms cannot meet rising standards in high-value markets? Or do government policies favor industrial operations by providing subsidies and loans, and building roads and infrastructure in places less useful to poor farmers?

To understand exactly what factors contribute to small-farmer participation in high-value markets and what government policies foster or preclude that participation, IFPRI researchers and colleagues in developing countries are collecting extensive data on three groups: small-farm households that are active in high-value markets, small farms that are not, and larger farms that compete with small farms. Then, modeling techniques estimate how each characteristic contributes to the probability that a given household will participate in global markets and which factors promote competitiveness.

“Household surveys show that small farmers get a much higher share of their much lower incomes from raising animals,” says IFPRI senior research fellow Christopher Delgado, who conducts research on the dramatic role livestock is playing

The goal of this research is to find ways to encourage small-farmer involvement in lucrative high-value markets . . .

in developing-country and global food systems. “So when industrialized livestock operations displace these farmers, they’re really in trouble. The goal of this research is to find ways to encourage small-farmer involvement in lucrative high-value markets and to focus on the cooperative institutions that will keep small farmers playing an active role so that they can stay in their

rural communities, rather than being forced to migrate to cities. With this kind of analysis, governments can avoid the policy distortions that subsidize large but not small farms, and provide the legislative and judicial environment conducive to the formation of farmer-led institutions such as producer cooperatives that cut the overhead costs of buying inputs and of marketing outputs.”

High-value commodities are often perishable and must be harvested, processed, and delivered fresh. “Increasingly,” Delgado explains, “urban consumers are also demanding and paying for predictable, uniform, and safe food that not only meets WTO quality and sanitary standards, but can also be verifiably certified as such. Small farmers are having trouble meeting these demands.” Is perishability keeping small farmers out of the prosperity loop?

“In the tropics,” Delgado says, “small producers and buyers both face high risks. Milk is a commodity for which spoilage and timely delivery are key issues. A customer might want a steady but not very large daily supply, whereas a small farmer who produces the right amount might be able to deliver it one day, but not the next.”

“Without credit, however, small farmer participation in markets is difficult, no matter what the product,” Delgado says. “But lots of things determine whether small farmers can compete in high-value markets. Many of these factors are unobservable. They might be transaction costs—like the dairy farmer who does not deliver milk to markets where there is a risk that he will be forced to sell at a steep discount or be left holding milk that will quickly spoil if not sold. Or there might be simpler explanations. If a farmer has been to school, he can read instructions and use inputs properly. If the farmer’s children work outside the country and send remittances, he will have the capital to buy needed inputs, even if he has no access to credit.”

Nowhere is the global battle between bigger-is-better and small-is-beautiful more apparent than in the livestock arena. Large, peri-urban livestock enterprises are rapidly displacing smallholders from high-value, international and in-country urban markets for meat. In Taiwan, livestock production has become entirely industrialized over the last 40 years. But because the transition from small farms to livestock factories took place over several decades, small farmers who used to sell poultry and hogs had the luxury of time to adjust their methods or to make the transition from one livelihood to another. Today in many parts of the developing world, livestock industrialization is happening almost overnight.

Are economies of scale and efficiency driving the industrialization of livestock in Asia or is public policy promoting it? The answer to this question has serious ramifications for over three-quarters of people in developing countries that live in rural areas and depend on agriculture for their livelihoods. “Industrialized livestock production and

processing feed urban consumers faster and cheaper than artisanal animal husbandry,” Delgado says. “But industrialization pushes smallholders out of agriculture’s most lucrative and fastest growing sector. That harms poor producers and the environment. There are major opportunities for small farmers in the globalizing economy, but also major dangers. This research should help policymakers design programs that maximize the promise of globalization for poor farmers.”

While most meat in developing countries is still produced and traded locally, fruits and vegetables have become hot international commodities. IFPRI research fellow Nick Minot has been studying postharvest activities in horticulture in Viet Nam, Bangladesh, and elsewhere. “As developing countries urbanize and grow richer, people spend more and more on processed rather than raw foods.” For example, instead of buying rice to make noodles, a consumer would purchase rice noodles. By catering to high-income consumers at home and abroad, Viet Nam has greatly expanded fruit and vegetable production and sales. Fruit and vegetable exports, less than 4 percent of production, rose dramatically from US\$60 million in 1998 to around US\$304 million in 2001.

Little could have been exported without postharvest processing, which includes quality control: sorting, grading, storing methods that ensure shelf life, and attractive packaging, as well as canning, freezing, and other forms of preservation. In 2002, IFPRI will complete a project using survey data to analyze horticultural growers, traders, and processors, and it will launch a new project to study the contribution of horticultural production and other forms of income diversification to poverty reduction.

TRADE AND MACROECONOMICS

T*rade is an integral part of the quest for food security. How international trade is structured, how macroeconomic policies position agriculture within a national economy, and how a national economy operates within the global market system are critical factors in reducing hunger. What we need are pro-poor strategies,” says Trade and Macroeconomics Division (TMD) director Sherman Robinson. As globalization accelerates, the food and agricultural sectors in developing countries are inseparable from the context of their national economies and the world market. Changes in world markets affect national economic growth and changes in nonfood policies affect the performance of food and agriculture sectors. The Trade and Macroeconomics Division analyzes the impact that national policies and the global economic environment have on agriculture, poverty, hunger, and natural resource use in developing countries.*

IMPROVING GLOBAL MARKETS FOR THE POOR

Globalization is a contentious subject. To some, it is something governments are “doing” to their citizens as a result of policy choices such as market liberalization and structural reform of the economy. To others, it is something that is “happening” as a consequence of forces outside the control of any country, due to advertising, rapid communication and transportation, technological change, population growth, and other trends.

Critics believe globalization exacerbates inequalities between rich and poor while proponents believe it brings unprecedented opportunities to billions of people through economic liberalization. At IFPRI, globalization encompasses much more than capital, labor, and technology flows. It

also refers to increased political, cultural, and social linkages among people and nations; to common legal and regulatory frameworks and institutions, from environmental and trade treaties to international agreements on best banking practices or anticorruption measures; and to the emergence of global effects resulting from the behavior of individuals and societies, from the spread of HIV/AIDS to recurrent financial crises.

IFPRI research, summarized in a collection of briefs titled *Shaping Globalization for Poverty Alleviation and Food Security* (2020 Focus 8), shows that development aid in the form of antipoverty programs is not enough to make globalization work for the poor. The international community must also establish better, fairer global institutions of governance. External macro developments due to globalization, natural shocks such

as the El Niño events of 1997/98, or the Asian financial meltdown of the 1990s plunged millions of people into poverty. Although developing countries must reduce their vulnerability to such events through better national policies, such changes are not enough if industrialized countries do not foster world financial stability through the World Trade Organization (WTO)

and the General Agreement on Tariffs and Trade (GATT), and by supporting strategies for poverty reduction in low-income countries.

Rich nations have pressured developing countries to open their markets to imports while erecting trade barriers that make it impossible to compete and cripple efforts to expand trade in agricultural and textile products, which reflect the developing world's human and natural-resource endowments. Industrialized nations must do their part by eliminating the agricultural protectionism and high subsidies that have limited growth in the developing world.

Developing countries have been told repeatedly to put their own houses in order. IFPRI senior research fellow Eugenio Díaz-Bonilla recommends that developing countries work to “eliminate biases against the agricultural sector in the WTO’s general policy framework, and to increase investments in human capital, land tenure, water access, technology, infrastructure, nonagricultural rural enterprises, organizations of small farmers, and other forms of expansion of economic, social, and political capital for the poor and vulnerable. At the same time,” he says, “developing countries



may legitimately insist that industrialized countries first reduce their higher levels of subsidization and protection, and ask for policy instruments to protect the livelihoods of the rural poor from import shocks that could cause irreparable damage.”

If the WTO is to fulfill its responsibilities to developing countries, which comprise the

majority of its membership, it will need better definitions of food insecurity based on objective, quantitative indicators. WTO’s current classification of countries into developed, least-developed (LDC), and net-food-importing developing (NFIDC) country categories does not capture their real levels of food security. Díaz-Bonilla analyzed national-level food security in 167 countries using objective, quantitative indicators and new categories: food insecure, food neutral, and food secure. He then compared his categories with WTO’s. He found that all developed countries are food secure; WTO members classified as developing countries experience all levels of food insecurity; only 10 of 18 NFIDCs are food insecure, suggesting that importing food is a weak indicator of food insecurity; almost all LDCs are food insecure; and some WTO members that are neither LDCs nor NFIDCs are food insecure. Díaz-Bonilla’s revised categories, which are based on hunger rather than market indicators, reflect a more accurate, nuanced picture of a country’s food-security situation than the WTO scale.

The food and agricultural system in a developing country does not operate in isolation, but is linked to the rest of the economy and the world

through a network of markets. The effects of changes in policies, even policies aimed at particular sectors, and changes in world markets reverberate throughout the national economy. IFPRI's study of tobacco farming in various developing countries illustrates the complex interplay of these many influences and exemplifies how trends and policies established in rich countries can create or undermine livelihoods in the developing world.

Tobacco has been a cash crop for centuries. When Christopher Columbus discovered America in the 15th century as part of an earlier globalization, he also discovered a powerful new commodity for the world market: tobacco. Aboriginal peoples throughout the Americas used tobacco. They introduced it to Portuguese, Spanish, Dutch, and English sailors, and the smoking habit spread to Europe and Asia through the global trade routes of the 16th century. Tobacco cultivation in the New World and elsewhere expanded to meet growing demand. Tobacco occupied such an important place in the economic and commercial development of the North American colonies that it was used as a monetary standard in place of gold and silver, and a tobacco leaf was stamped upon the currency used during the American Revolution. Literally and figuratively, tobacco was a major cash crop.

In many developing countries it still is. But today, globalization is shrinking rather than expanding the world market for tobacco. Always controversial because of its addictive nature, tobacco use is

The effects of changes in policies, even policies aimed at particular sectors, and changes in world markets reverberate throughout the national economy.

declining in the U.S. because it has been proven to cause serious health problems. As the successful campaign against it in the United States spreads to other parts of the world, diminishing consumer demand for tobacco products will affect the livelihoods of farmers who grow this increasingly controlled substance.

To estimate the impact on individuals and national economies of reduced tobacco demand and declining tobacco prices, and to determine what national policies might be put in place to deal with this impending shock, IFPRI analyzed four tobacco-producing and exporting countries: China, Turkey, Malawi, and Zimbabwe. In the general equilibrium model used in this study, the importance of the tobacco sector to a country's economy determines the degree of impact on a country's economy when world tobacco demand and prices decline.

Though China is the largest producer and consumer of tobacco in the world, trade accounted for a trivial share of its tobacco production and consumption. In addition, the Chinese government strictly controls tobacco production, marketing, cigarette processing, and distribution. For this reason, the study considered the impact of domestic policy shifts—increasing cigarette consumption taxes, raising cigarette prices, cutting low-quality cigarette production, and reducing tariffs on tobacco imports—on China's domestic market, rather than the possible impact on China's exports of changing world tobacco prices.

By contrast, Turkey, Malawi, and Zimbabwe are among the largest tobacco exporting countries in the world. Due to differences in economic development, tobacco accounts for only 1 percent of Turkey's gross domestic product (GDP), 14 percent of Malawi's GDP and 50 percent of its exports, and 7 percent of Zimbabwe's GDP and 35 percent of its total exports. Since the economies of Malawi and Zimbabwe depend heavily on tobacco production and exports, these two countries are expected to suffer more than Turkey. Malawi and Zimbabwe are among the poorest countries in the world, so the effects of decreased world tobacco prices on their rural economies will be significant.

For example, if lower demand causes world tobacco prices to fall by 40 percent, tobacco export revenues would fall by 66 percent in Malawi and by 57 percent in Zimbabwe. Lower demand also leads to lower production, so if tobacco prices declined by 40 percent, Malawi's production would fall more than 50 percent. However, in Turkey, where tobacco accounts for less than 2 percent of agricultural GDP, production would fall by less than 15 percent.

Switching to other crops may reduce the negative effect on farmers' income caused by a decline in tobacco prices. But this is difficult. In Malawi, tobacco is the crop that contributes most to farmers' cash revenue. The export demand for tobacco leaf has been quite stable over time, while markets for other crops may not exist. This constrains farmers' choices and forces them not to factor the cost of their family labor into tobacco production. If the price farmers get covers their cash expendi-

tures on fertilizers, interest on loans and the like, farmers may continue to grow tobacco for a time regardless of lower tobacco prices. But with or without production declines, the revenue from tobacco production would shrink dramatically. Tobacco production, which used to generate large cash profits for farmers in Malawi, will eventually yield almost no profit, especially for small farmers.

In Zimbabwe, where tobacco is mainly grown on large farms, the scenario is quite different and so are the impacts of the world movement to reduce smoking. Tobacco production employs almost 50 percent of Zimbabwe's unskilled workers. Therefore, declines in tobacco exports and production would drive wages down and unemployment up for many poor people.

Lurking behind these findings is the issue of diversification in monoculture societies, according to Trade and Macroeconomics Division director Sherman Robinson. "It is very difficult to supplant a crop of superior profitability, such as tobacco, opium poppies, or coca," he says, "because farmers simply can't earn enough from the much lower proceeds from other crops."

Whether farmers stop raising cash crops because government policies against them are enforced effectively or because the market disappears when masses of people change their behavior (in this case, stop smoking), the dilemma is the same. Developing countries that depend heavily on exports of a single or primary agricultural commodity are at risk. For them, national policies and research that support a more diversified and flexible export structure are necessary.

Network of IFPRI Associates

The Network of IFPRI Associates (NIA) formalizes long-term ties with researchers and policy advisers from institutions in developing and developed countries. There are currently 22 members, who are key contacts for IFPRI research and outreach in their fields of expertise and in their countries of origin or citizenship. The associates frequently visit IFPRI headquarters, collaborate with IFPRI researchers, and access IFPRI's library, data sets, and computer facilities.

IFPRI associates praise the support and opportunities available through NIA. "Since my initiation into NIA, I have performed research on monitoring systems for watershed management and issues in sustainable food security in Mesoamerica by 2020," Rafael Celis, an IFPRI associate during 2001 says. "I have taken part in workshops on watershed monitoring and a symposium on food security. I have been able to play two different roles—translator and logistical coordinator. I translated the 2020 Vision policy brief titled *Agricultural Research and Poverty Reduction* and the book titled *The Unfinished Agenda: Perspectives on Overcoming Hunger, Poverty, and Environmental Degradation* into Spanish. Another great benefit has been the growing number of friends in development that I have made."

According to Jikun Huang, also a 2001 associate, "Being a member of NIA has provided an avenue for collaborative research between Chinese and IFPRI researchers on important policy issues. It has ensured that research publications examine policy implications. I have been able to participate at all stages of a project, including proposal preparation, survey design, data analyses, publications, and outreach."

NIA fosters relationships among peers and helps predict upcoming policy research needs. Members benefit from contact with the many disciplines the associates represent and have recommended inclusion of more non-social-scientists and non-economists in the future. NIA members who work in academic institutions especially appreciate their participation in IFPRI's practical, problem-driven research.

NIA Members

Julian Alston, University of California-Davis, U.S.A.

Margaret Armar-Klemesu, Ministry of Health, Ghana

Rafael Celis, ProDesarrollo Internacional, Costa Rica

Archilles C. Costales, University of the Philippines, Philippines

Marcel Fafchamps, Oxford University, U.K.

Shelley Feldman, Cornell University, U.S.A.

Timothy Frankenberger, Technical Assistance to NGOs International, U.S.A.

Robin Graham, University of Adelaide, Australia

Jikun Huang, Chinese Academy of Sciences, China

Michael Kirk, Philipps-University Marburg, Germany

Wilberforce Kisamba-Mugerwa, Ministry of Agriculture, Uganda

Bernard Kouassi, SADAOC, Burkina Faso

William Masters, Purdue University, U.S.A.

Julian May, University of Natal, South Africa

Marcus Noland, Institute for International Economics, U.S.A.

Keijiro Otsuka, Foundation for Advanced Studies on International Development, Japan

Ruerd Ruben, Wageningen University, The Netherlands

Quazi Shahabuddin, Bangladesh Institute of Development Studies, Bangladesh

Finn Tarp, University of Copenhagen, Denmark

Sukhadeo Thorat, Jawaharlal Nehru University, India

Linxiu Zhang, Chinese Academy of Sciences, China

Funing Zhong, Nanjing Agricultural University, China

COMMUNICATIONS

I*f a tree falls in the forest and no one hears it, does it make noise? Physicists would say yes, explaining that the phenomenon of sound abides by certain rules regardless of whether a human ear receives it. IFPRI Communications Division staff would say, yes, but noise isn't impact. It is not sufficient for IFPRI's policy research results to be clear, groundbreaking, or even revolutionary. The knowledge IFPRI creates must also reach those who need to hear it in a form they can understand and use.*

“Every IFPRI researcher and staff member is committed to making a difference in the lives of poor and hungry people,” says Klaus von Grebmer, Communications Division director. “Our job is to provide the medium for their message through state-of-the-art communication products and services.” To that end, the Communications Division works closely with IFPRI research staff to create attractive, accessible publications that reach key audiences at many different levels: government officials and policymakers in developed and developing countries, leading academics and professionals in economics and agriculture, concerned citizens and activists, and prominent journalists.

“IFPRI must engage in a continuous process of communication,” von Grebmer asserts. “So we promote a strong brand image based on a consistent, distinctive look. The colorful new formats we launched in 2000 and expanded in 2001 help ensure that IFPRI's work is recognized, accepted, and shared. Our portfolio of products and services aims to enhance IFPRI's influence on food policy so that it reinforces our mission. High-quality, relevant, cutting-edge research results can help fight hunger and malnutrition only when they are widely and appropriately promoted and their content is understood.”

PUBLICATIONS

In many respects, IFPRI has earned its strong reputation through its research report series, which focused in 2001 on topics ranging from food security and natural disasters in Bangladesh to the effects of structural adjustment in Tanzania. IFPRI also published research findings on biotechnology, the long-term global food outlook, trends in and returns to agricultural research and development spending, globalization and food security, women and food security, and agricultural markets. These publications appeared in IFPRI's long-established series in the following quantities: nine research reports and abstracts, one food policy review, five in-house books, two food policy reports, five food policy statements, two issues of *IFPRI Perspectives*, several brochures and issue briefs, and an annual report. Johns Hopkins University Press published four IFPRI books.

Three of these books and one of the food policy reports came out under the auspices of IFPRI's 2020 Vision Initiative, which also collaborated with the Communications Division on two discussion papers, five sets of focus briefs, three individual briefs, one 2020 booklet, and three issues of *2020 News & Views*. Twice as many

books and research reports were published in 2001 than in the previous year.

IFPRI improved its marketing and distribution strategy for in-house books by designing them in more attractive ways, using promotional comments on the back cover, distributing some of the books through Johns Hopkins University Press, widely distributing flyers about the books, and disseminating the books more consistently through bookstores.

“2001 publications are visually appealing, with consistent style and design elements that contribute to the visual branding of IFPRI’s print materials,” says Evelyn Banda, head of Publication Services. “Bright colors, expressive photos, original art, and imaginative design make IFPRI books and newsletters eye-catching to busy audiences that have many other information alternatives. With distinctive design that denotes IFPRI’s brand of first-class research, the institute’s recent publications stand out and are readily recognizable, the same way the most trusted commercial products are,” she says.

Several books were aimed at a broader popular audience: *Seeds of Contention*, *Who Will be Fed in the 21st Century?* and *The Unfinished Agenda*. The latter, a collection of recent 2020 briefs, newsletter articles, and other writings, has had the broadest appeal so far of any in-house IFPRI book. IFPRI also published a colorful booklet of posters and writings submitted for the 2020 Vision Initiative’s highly successful international youth poster and essay competition.

IFPRI also developed a new book series—technical guides to food security for practitioners in the field. The first volume focused on methods for

monitoring, evaluating, targeting, and otherwise putting rural development projects for food security into operation.

Increasingly, IFPRI publications are moving toward a vivid, reader-friendly writing style that conveys the human interest inherent in research and the stories of the people who will benefit from it. Many have been translated into French and Spanish, and a few are available in Japanese, Chinese, German, and Danish to achieve maximum outreach.

IFPRI reaches broad audiences with its newsletters as well. The 2020 newsletter, *News & Views*, allows the institute not only to disseminate research findings, but also to take up new topics or present long-standing topics from a fresh perspective. The magazine-style feature articles present issues in a thorough, informative way that covers all sides of the debate.

“We are particularly pleased with the quantity and quality of IFPRI’s 2001 publications, which are diverse in purpose and varied in tone,” says senior editor Uday Mohan. “We published three attractive, high-quality trade books on biotechnology alone in 2001, fulfilling our goal of issuing serious, competitive books on pressing development issues that are very much in the news.”

This approach reflects the evolving, expanding audiences identified in 2001 as part of the Communications Division’s deliberate new publications strategy, Mohan notes. “We now see our audience in four broad categories: the experts (academics and researchers), the insiders (policy-makers and officials in the development community), the interested (concerned citizens and activists), and laypeople (the general public).”

KNOWLEDGE MANAGEMENT

Before the Internet and the Worldwide Web, libraries measured their stature and success by the importance, size, growth, and circulation of their print and other tangible collections. Print materials are still important because many developing countries do not yet have the capacity to take full advantage of electronic document transmission. But for those with computer capability, the Web is the way.

“Not too long ago, the basic function of the IFPRI library was to arrange interlibrary loans. It could take several days for IFPRI staff to receive documents from institutions outside Washington, DC,” IFPRI head librarian Luz Marina Alvaré says. But in IFPRI’s transformed knowledge management center, “IFPRI researchers can retrieve an article from their desktops in less than 24 hours and many IFPRI publications are available electronically to those outside the organization just as rapidly,” she says.

In 2001, the library launched a new website to facilitate access to IFPRI information. More than 600 documents in PDF format and 2,470 web pages have been added for public access, resulting in increased downloads and hits from “search spiders” compared to 2000. The library offers access to 114 journals and 21 databases to staff and website visitors, and posts the work of IFPRI researchers published elsewhere after obtaining permission from outside publishers. IFPRI’s website is appearing more and more frequently in the indexes of other search engines such as Google and sites such as that of the World Bank. And the library has increased IFPRI’s audiences in previously untapped regions by posting research in Spanish, French, Portuguese, Japanese, Chinese, and German.

The results have been gratifying. A growing number of visitors to the IFPRI website are from non-Northern countries, including significantly increased interest from Malaysia, South Africa, Argentina, Brazil, India, Singapore, Indonesia, Thailand, Saudi Arabia, Chile, Nepal, Colombia,

General Web Statistics, 2001



Zimbabwe, Qatar, Pakistan, Philippines, and Peru. IFPRI's website offered complete coverage of the 2020 Bonn conference in September 2001. That month, the website received 32,772 visitors, well above the previous record of 15,955 for a single month in 2000.

Under Alvaré's leadership, IFPRI spearheaded the Global Knowledge Initiative that brought together librarians and information management specialists from Future Harvest centers, the CGIAR Secretariat, and the Food and Agriculture Organization of the United Nations (FAO). With funding from the CGIAR's Organizational Change Program, IFPRI hosted a workshop in Washington, DC.

"A community of practice that included both information managers and webmasters emerged from this workshop," Alvaré says, "as well as recognition of common needs and the will to share our collections. We agreed on priority actions that would help us all expand our services even though our budgets were being cut. Joint acquisition of subscriptions, by which one Future Harvest center pays for a journal but all the centers can use it, is just one example of the economies we achieved. The systemwide gains were really strong. The one-license-for-all approach alone saved the system over US\$100,000. We realized similar savings by purchasing InMagic software once and sending it to the web hoster used by all Future Harvest centers. We have also been exploring new methods for



providing free or reduced-price journals to developing countries," she said, emphasizing IFPRI's mission of disseminating information to benefit poor people.

The Future Harvest centers and FAO also initiated the Info Finder database, which contains documents and websites from all centers, with direct links to the full texts. IFPRI contributed

more than 30 percent of the web pages and documents.

The success of the IFPRI website, Alvaré believes, is due to the fact that it has been created by a collaboration between Computer Services and the Communications Division. "Information managers understand how people look up information and how information is categorized," she says. "We are working to make the website serve the researchers by using our expertise as knowledge brokers and by asking researchers to participate and provide feedback. IFPRI's website is being designed with the people who use it, not by web developers alone."

As a consequence, Alvaré says, "We can increase the size of our collections, make our money last longer, and give and get better service. IFPRI's website is a powerful component of the Communications Division's public dissemination strategy. Now, in addition to coverage by the news media, people can go directly to IFPRI's research with just a click of the mouse."

MEDIA RELATIONS

In 2001, IFPRI's media relations team, headed by Michael Rubinstein, conducted 10 major media campaigns to publicize the Institute's cutting-edge research, resulting in more than 2,000 articles, interviews, and commentaries.

"With the World Food Prize, the 2020 Vision Initiative's conference in Bonn in September 2001, and the release of two major reports, this was the best year ever for media coverage of IFPRI research," says Rubinstein.

IFPRI released the first of these reports, the most comprehensive study of the environmental state of agricultural lands to date, at the National Press Club in Washington, DC, in cooperation with the World Resources Institute, the CGIAR Secretariat, and the World Bank. The Bloomberg news wire, *Financial Times*, *Hindu Business Line*, and *Nature* magazine all ran articles, and about 300 newspapers with a combined circulation of more than 13 million picked up an article by the Associated Press.

The second report, *2020 Global Food Outlook: Trends, Alternatives, and Choices*, forecasts the worldwide food situation 20 years into the 21st century. When it was released in Berlin, it was covered by *allafrica.com*, Agence France-Presse, Associated Press, BBC News, Canadian Press, *Economist*, *Financial Times*, MSNBC, Press Trust of India, Reuters, *Times of India*, *Washington Post*, Xinhua News Agency, and many others.

The 2020 conference in Bonn generated enormous media interest. About 40 journalists from Africa, Asia, Latin America, and Europe participated in the three-day event and about 90 journalists attended the opening-day press conference. They filed numerous stories in European and developing-country newspapers and on radio. Saturation cov-

erage in the German print media produced 174 articles with a total circulation of 36 million. President Johannes Rau of Germany was shown on prime-time television news speaking at the opening of the conference and radio news reports were broadcast throughout the country.

Journalists in Denmark, France, India, and the United States gave prominent coverage to the announcement that the 2001 World Food Prize was awarded to Per Pinstrup-Andersen.

Obviously, the quality and quantity of IFPRI research make it worthy of coverage. But preparation, legwork, and media savvy also account for the media attention achieved in 2001. With the addition of a second communications specialist, the media team was able to significantly improve its ability to produce successful media events, submit more op-eds to prominent newspapers, and maintain relationships with journalists. In 2001 for the first time, IFPRI offered journalists a media resources kit, with basic information on the institute and selected reader-friendly thematic briefs. Beginning in 2001, press materials from each major media campaign were posted on IFPRI's website.

"In order to have impact, IFPRI's research must reach people with influence, such as policymakers and donors. Media coverage is one of the most powerful ways to reach these audiences," comments Rubinstein.

POLICY SEMINARS PROGRAM

The smooth functioning of the hugely successful 2020 Vision Initiative conference, *Sustainable Food Security for All by 2020*, in Bonn, Germany, was due to the contribution of the planning, logistical expertise, and attention to detail of Laurie Goldberg and Simone Hill-Lee, who are behind many of IFPRI's seminars, work-

shops, and conferences. As veteran conference participants know from experience, a well-organized meeting sets the stage for them to exchange ideas and make the personal connections that are the purpose of such gatherings. Presenters and attendees who find a warm reception, hassle-free registration, appropriate meeting rooms, functioning sound systems, correctly spelled name badges, and adequate signage can concentrate fully on the work at hand.

“Organizing the 2020 Conference was a huge challenge, but at the same time it was exciting and extremely rewarding,” Goldberg says. “The success of the conference was attributable to a very productive team effort by many people.”

In addition to the Bonn conference, the policy seminars team organized six workshops in Washington, DC, and overseas. Topics included HIV/AIDS, information and communication technology and poverty reduction, global knowledge sharing, assessing the impact of policy-oriented social science research, and future opportunities for rural Africa.

Working with the policy and research seminars committee within IFPRI, the Policy Seminars Program also coordinates and organizes presentations on the results of recent research on topics of interest to IFPRI, its partners, and its clients. In 2001, 13 policy and book-launching seminars were held in IFPRI’s recently remodeled meeting room. IFPRI research staff presented at seven of these events. A total of 800 people attended the 2001 series.

All events were held at IFPRI headquarters unless otherwise specified.

MEETINGS

Meeting of the International Advisory Committee for the 2020 Conference—Bonn, Germany, January 12

Meeting of the IFPRI Board of Trustees—IFPRI, Washington, DC, March 5-7

CONFERENCES/WORKSHOPS

DFID-IFPRI Consultation on HIV/AIDS and Rural Livelihoods—Washington, DC, January 8-9

IFPRI Symposium on Strengthening Development Policy by Looking Within the Household—Washington, DC, February 1

IFPRI Consultation on ICTs and Poverty Reduction—IFPRI, Washington, DC, February 26-27

Global Knowledge Sharing Workshop—IFPRI, Washington, DC, March 19-23

Sustainable Food Security for All by 2020—Bonn, Germany, September 4-6

Workshop on Assessing the Impact of Policy-Oriented Social Science Research—The Hague, Netherlands, November 12-13

USAID-IFPRI Workshop on Future Opportunities for Rural Africa—IFPRI, Washington, DC, November 26-27

SEMINARS, WORKSHOPS, AND CONFERENCES, 2001

POLICY SEMINARS

Governing the GM Crop Revolution: Policy Choices for Developing Countries—Robert Paarlberg, Wellesley College and Calestous Juma, Harvard University, January 18

2020 Panel Discussion—Health and Nutrition: Emerging and Re-emerging Issues in Developing Countries—Rafael Flores, IFPRI; Anthony Barnett, University of East Anglia; Reynaldo Martorell, Emory University; Noel Solomons, Center for Studies of Sensory Impairment, Aging and Metabolism; Stuart Gillespie, IFPRI, February 27

The Impact of Trade Liberalization on Developing Countries—Brian Fisher, Australian Bureau of Agricultural and Resource Economics (ABARE); Eugenio Díaz-Bonilla, IFPRI, April 9

HIV/AIDS: Food and Nutrition Security—Stuart Gillespie, IFPRI, May 3

Food Safety at the International Level—Lester Crawford, Georgetown University, June 7

Pilot Analysis of Global Ecosystems: AGROECOSYSTEMS—Stanley Wood and Kate Sebastian, IFPRI; Sara Scherr, University of Maryland, June 21

Food for Schooling: Feeding Minds, Reducing Hunger—Akhter Ahmed, IFPRI; Werner Kiene, World Food Programme, June 28

Can Public Programs Ease the Burden of Poverty? IFPRI's Evaluation of PROGRESA—Emmanuel Skoufias, IFPRI, October 4

Biotechnology in a Complete System of Genetic Improvement: A Perspective on Developed and Developing Countries—Greg Traxler, Auburn University, October 18

False Promise or False Premise? The Experience of Food and Input Market Reform in Eastern and Southern Africa—Thomas Jayne, Michigan State University, November 15

Biotechnology and Developing Countries—Per Pinstrup-Andersen, IFPRI; Robert Paarlberg, Wellesley College; Phil Pardey, IFPRI, November 28

Famine, Recovery and Agricultural Development—Andrew Natsios, USAID, December 13

BOOK LAUNCHINGS

Ending Rural Poverty in the 21st Century: Highlights of a Report—John Westley, Atiqur Rahman, and Phrang Roy, IFAD; Peter Hazell, IFPRI, February 8

Transforming the Rural Asian Economy: The Unfinished Revolution—Mark Rosegrant and Peter Hazell, IFPRI, May 29

RESEARCH SEMINARS

The Implications of Gender Differences in Land Inheritance and Education for Lifetime Incomes: Evidence from the Philippines, Sumatra, and Ghana—Agnes Quisumbing, October 11

Agricultural Trade Liberalization and Domestic Market Reforms: Implications for Food Security in South Asia—Paul Dorosh, November 16

Late in 2001, the Policy Seminar Program introduced the Research Seminar Series primarily for IFPRI staff to focus on issues, methods, data, and results. These seminars follow the same format as the policy seminars, giving equal time to presentation and discussion. These seminars will occur monthly, except for July and December. To continue improving the in-house seminars, evaluation forms are distributed at every event.

TRAINING FOR CAPACITY STRENGTHENING PROGRAM

Public-policy and agricultural researchers in developing countries are scarce and the demand for their skills is great. For many, the lure of the private sector is too strong to resist. Researchers often leave academic or agricultural institutions for better paying jobs either implementing programs in international agencies or as consultants in private industry.

IFPRI's Training for Capacity Strengthening Program helps retain talented students, researchers, and professors in the field by improving their ability to get the funding and skills they need to launch and maintain their research careers. "If we make it possible for researchers to earn enough money and help them initiate and solidify their careers, there's a good chance they'll stay in research," says Suresh Babu, senior research fellow and head of the program.

"Sometimes local researchers already have the skills to carry out their work, but they may founder because they lack a network of contacts and relationships with donors, or can't write research proposals that get funded. Sometimes they are good at raising money, but don't have the knowledge and skills to carry out the research they propose. We help them learn both proposal writing skills and research methods such as study design, data collection, data analysis, and drawing policy implications from the results."

IFPRI offers support at every step along the way. To encourage people to enter and remain in public policy research, the program works closely with the 2020 Vision Initiative's grant program to young scholars. The Training for Capacity Strengthening Program offers grant writing seminars, peer review workshops, and research-skills training. After young scholars have completed their research and written reports on their results, IFPRI's next step is to help them publish in international journals. "This gives them credibility as researchers locally," Babu says, "and also helps them gain recognition within the international community. Then, to make the connection between research and policy, we help them transform their academic reports into policy briefs and memoranda. Finally, presentation skills help them to communicate with decisionmakers effectively."



In 2001, the Training for Capacity Strengthening Program supported international organizations by building on linkages with regional organizations such as the Food Security Network for West Africa (SADAOC). “We identify themes and collaborate with established groups to develop training courses using IFPRI publications. In turn, university professors and researchers go back to their countries and pass this learning on to graduate students, peers, and others. This ‘each one, teach one’ approach creates multiplier effects at the country level,” Babu says. The Training for Capacity Strengthening Program also helped the Global Development Network award prizes to deserving researchers by critiquing papers and proposals.

The Training for Capacity Strengthening Program also works with international development agencies to find thematic issues that can be developed into regional strategies. IFPRI joined the United Nations Conference on Trade and Development (UNCTAD) to organize a regional workshop in Almaty, Kazakhstan, on food security and agricultural diversification. “That meeting brought 30 policy researchers and decisionmakers together to work on a market liberalization strategy for Central Asia,” Babu reports. “We sought to understand how markets could be used to develop smallholder agriculture in the countries of the region. It was a good opportunity to incorporate IFPRI research into country planning and to get IFPRI findings on the agenda of international agencies.” The papers prepared for that meeting will be edited and published as a book.

In Lima, Peru, the Training for Capacity Strengthening Program taught the first half of a two-week course in food economics at La Molina National Agrarian University. Participants from 10 Latin American countries attended as part of a master’s of science program in public nutrition. IFPRI research reports furnished the basic texts for the teaching and training manuals created for the workshop.

“We also helped organizations devise research-based strategies by incorporating IFPRI work into major strategy papers,” Babu says. “For example, Malawi’s taskforce to develop a food policy strategy included lessons learned from other countries where IFPRI has worked. Similarly, IFPRI’s work in Bangladesh and India helped to set research priorities and create a national food policy strategy.”

Postdoctoral Fellowship Program

IFPRI’s postdoctoral fellowship program aims to achieve sustained capacity in policy research on food, agriculture, and natural resource management in developing countries. It also seeks to communicate the results of research undertaken by the fellows to ensure maximum policy impact.

In 2001, IFPRI offered postdoctoral fellowships to three outstanding applicants: Simphiwe Ngqangweni, South Africa; Anitha Ramanna, India; and Jing Zhu, China. Ngqangweni researched livestock and livelihoods of the poor in the rural Northern Province of South Africa with Chris Delgado (MSSD). Ramanna collaborated with Phil Pardey (EPTD) on the political economy of India’s intellectual property rights policies and on agriculture, while Zhu worked with Shenggen Fan (EPTD) to understand China’s public investment and long-term food security situation under WTO.

Recipients express great appreciation for the postdoctoral fellowship. To be associated with IFPRI for a year gives them confidence and strengthens their skills. “Being introduced to IFPRI’s noble vision and being involved in work that realizes that vision has opened our eyes and helped us focus as we pursue our careers,” said one postdoctoral fellow. “We have had a chance to work with thoughtful, skilled, and experienced researchers of international caliber, from whom we have learned a great deal.”

A 2020 VISION

FOR FOOD, AGRICULTURE, AND THE ENVIRONMENT

2001 was a year of extraordinary accomplishment for the 2020 Vision for Food, Agriculture, and the Environment Initiative. The tremendously successful Sustainable Food Security for All by 2020 conference brought over 900 participants from more than 70 countries together in Bonn, Germany, for three intense days of sharing ideas and information, and building a consensus for action to assure global food security by 2020. The 2020 Vision Network for East Africa carried out expanded knowledge- and capacity-building activities in six countries. And IFPRI's director general, Per Pinstrup-Andersen, received the World Food Prize, in part for his leadership of the 2020 Initiative, which was recognized as "the most comprehensive and ambitious research and dissemination program ever undertaken on global food security."

NOT YOUR TYPICAL RESEARCH CONFERENCE

When 2020 Vision head Rajul Pandya-Lorch and her staff began planning the Bonn conference with the support of colleagues in the institute, they aimed to include stakeholders at every level in a forum to examine "a number of emerging or intensifying developments with implications—sometimes positive, sometimes negative, sometimes unknown—for global food security. Our objective," Pandya-Lorch says, "was to catalyze action, to break the malaise that is causing woefully slow progress in achieving sustainable food security for all by 2020. The driving forces now shaping food security, such as technological change, the accelerated pace of globalization, and the explosion of

health and nutrition crises were compelling reasons to revisit and reassess priorities for action."

Never did Pandya-Lorch imagine the level of interest the conference would generate. Over 1,600 people registered, though many could not come due to funding limitations or travel and visa constraints. Attendance was double what she anticipated. "I am humbled and awed by the energies coming together in this room," she said in her opening remarks in Bonn. "Imagine what we can do together to end hunger as we know it."

Indeed, the presenter roster was a who's who of policymakers, officials from multilateral agencies, NGO leaders, researchers, and business executives, many of whom paid their own way to be there.

The conference brought together a wide variety of traditional stakeholders and new actors. It is notable that 25 percent of the participants were from developing countries and 40 percent were female. Moreover, 25 percent were from NGOs, 20 percent were from government, and 10 percent represented the media. Six percent of participants were from the private sector.

In the interest of ending hunger, the conference drew very senior policymakers, including the president of the Federal Republic of Germany, the prime minister of Uganda, the European Union commissioner for development, and the director-general designate of the World Trade Organization. More than a dozen current and former ministers, vice ministers, and permanent secretaries of agriculture, finance, and foreign affairs participated on the panels or in the audience.

These and other conference participants grappled with the key food security issues the world will face over the next 20 years: the future of the small-scale farmer, the impact on developing countries of agricultural policies in developed countries, the role of good governance and anticorruption efforts in achieving food security, the implications of environmental and technical change for agriculture, the growth in urban populations, and many others. Participants even debated the question of whether food security was the proper focus.

Clare Short, member of parliament and U.K. secretary of state for international development, argued that measuring food insecurity as a ratio



Winner of the 2020 Vision poster competition, 2001.

of national-level food availability to population is misleading. If the poor do not earn enough money to buy food, they have no access to it, she said. Ending hunger, Short believes, therefore means ending poverty.

To ensure that the voices of farmers were heard and in recognition of their essential

contribution to achieving food security, the 2020 Vision team invited farmers from Honduras and India to be panelists. K. Rajarathinavelu of India told how his father had introduced a short-stature rice variety, IR-8, to the village of Allivaram in Tamil Nadu. “A wonder happened,” he said. “The new technology—seeds, fertilizer, machinery, and irrigation—[produced] an unimaginable threefold yield increase, [which] changed the village in many constructive ways. Now [people] send their children to school and bestow attention on their education. If not for the Green Revolution, these happenings would not have occurred in our village.”

Manuel de Jesus Reyes, a smallholder in Honduras who learned traditional agricultural methods from his father, recounted how the introduction of ecologically sustainable technologies ended the environmentally damaging cycle that begins with slash-and-burn and ends with soil depletion. “The main technologies were green manures, in-row tillage, and zero tillage, techniques I learned from an extensionist. Technologies such as chemical fertilizers and pesticides yielded about 0.6 ton per hectare. Now, I am producing between 2.5 and 3 tons per hectare of maize, more than my family can eat. I never thought I’d have extra grain to sell,” he said.

The 2020 Vision team sought diversity, and made a special effort to include the voices of the younger generation. Pandya-Lorch is proudest of the response from—and to—these young people at the conference. “They are the ones who are going to make the difference,” she says. To involve young people and get them to see what their role in ending hunger might be, IFPRI held poster and essay competitions for young students from around the world. From 600 entries, two winners and several runners-up were chosen. The winner of the essay competition, 17-year-old Thrishni Subramoney, joined the all-woman delegation from South Africa. After being introduced by South Africa’s ambassador to Germany, Thrishni delivered part of her essay in person. Her contribution and those of others were collected in a colorful booklet, *A Better World in 2020: Wake-Up Calls from the Next Generation*.

“The most important shake-up message came from the youngest participant, David Dalrymple,” according to Sartaj Aziz, a senator and former agriculture minister, finance minister, and foreign minister of Pakistan. Dalrymple, a 10-year-old student at the University of Maryland, spoke frankly. “Anything you do or don’t do will affect what I, and the rest of my generation, will have to deal with in the future,” Dalrymple told those assembled. “My peers and I will be in our late twenties in 2020 and will then be entering the role of decisionmakers. I implore the decisionmakers of today to take action now so my generation will not have as many of these issues to contend with in the future. Anything possible should be done. What seems impossible to many should perhaps also be attempted. To ignore these tasks is to condemn more than 1 billion people to being miserable for life.”

Geoff Miller, president of IFPRI’s Board of Directors, echoed the message that we are all responsible. He urged participants to turn what they had learned at the conference into action.

“It is not the priorities we set here that matter at the end of the day,” he said, “[but] the decisions that . . . you make when you go back to your own power base—no matter how big or how small that power base is. Every one of you who came here with commitment is going to go away with strengthened commitment, and every one of you has a responsibility.”

Continued high demand for 2020 Vision publications after the conference shows that stakeholder and public interest remains strong. More than 15 different publications were prepared for and released at the conference to share new knowledge and broaden the dialogue on food security: two discussion papers and three briefs, five collections of briefs in the Focus series, three books, one food policy report, three newsletters, and a colorful booklet of the winning posters and essays in the youth competition.

“Several conference participants told me how glad they were to have the publications available at the conference,” Pandya-Lorch says. “They didn’t want to have to wait two or three years for them.” The print materials, which are also available at IFPRI’s website, cover a wide range of topics, including emerging health and nutrition issues in developing countries, empowering women as a pathway to food security, appropriate technology, the relationship of agricultural research to poverty reduction, overcoming water scarcity and quality constraints, and global food projections.

Pandya-Lorch takes pride in having achieved all the objectives of the conference. “We brought new information and ideas to the forefront, we built consensus on what action is required to assure sustainable food security for all, and we facilitated dialogue and understanding among people on their roles and responsibilities in ending hunger,” she says.

NETWORK FOR EAST AFRICA

The aim of the 2020 Vision Network for East Africa, comprising Ethiopia, Kenya, Malawi, Mozambique, Tanzania, and Uganda, is to lay the foundation for sound agricultural and other policies that can help reduce food insecurity and poverty in the region. The 2020 Vision Network seeks to strengthen capacity for food policy research in East Africa by supporting researchers throughout the process of generating proposals, conducting the research, and disseminating the findings. The network does this by holding proposal-writing and peer-review workshops, offering a competitive grants program to support locally driven research, and supporting graduate-level students earning agriculture-related degrees, among other activities.

Under the second round of the grants program in 2001, researchers in the six network countries submitted 52 proposals, double the number in 2000. “We’re supporting over 70 researchers in East Africa,” Rajul Pandya-Lorch reports, “and we’re helping to keep them engaged in agricultural research in their own countries.” Topics include microfinance in Tanzania, smallholder cashew development in Mozambique, and demand for goat meat in Malawi. The 2020 Vision East Africa Network also launched the pilot round of its Student Affiliation Program in 2001. Ten master’s-level students have been selected. They are undertaking thesis research on topics or themes identified by network members as high priorities for their own countries.

Pandya-Lorch attributes the jump in applications for funding to the two-day proposal writing workshops offered by Suresh Babu of the Communication Division’s Training for Capacity Strengthening Program, in close collaboration with partners in each country. The response to these workshops has been overwhelming.

Originally, only three countries were scheduled for the workshops in 2001. But as news spread about their value, the other three countries asked to have their workshops in 2001 as well. More than 150 people attended the six workshops. In several countries, the turnout was twice the number expected, and people had to be turned away.

“The peer-review workshops held in each country to allow researchers to present their proposals were equally popular,” according to Pandya-Lorch. “Researchers got a chance to hear reactions and critiques from both peers and external reviewers. This gave the researchers the feedback and encouragement they needed to rewrite and improve their proposals.” The 170 researchers who sat together to consider each other’s work were wildly enthusiastic about the workshop format. “They learned as much from listening to other people’s proposals as they did when their own were being discussed,” Pandya-Lorch says.

Without the training in agricultural economics and technical assistance provided by the 2020 East Africa Network, academics and government institutions in the region might not have the personnel to tap agriculture’s full potential. To determine the extent of the problem, the network commissioned a review of the status of agricultural economics in eight countries in eastern and southern Africa. The study confirmed the widening gap between supply and demand for agricultural economists and suggested ways to remedy the situation, including altering content and delivery of training programs to meet the differing needs of the public, private, and civil society sectors.

“The 2020 Network for East Africa really took off in 2001,” Pandya-Lorch says. “Already we are building bridges between researchers and policymakers, and accomplishing our objectives.”

COLLABORATION

2001

In 2001, IFPRI worked with numerous local, national, regional, and international institutions and many individual researchers. The map below shows the kinds of collaborators IFPRI worked with in each country.





COLLABORATING INSTITUTIONS IN DEVELOPING COUNTRIES

AFRICA

BURKINA FASO

Programme Sahel Burkinabé

ERITREA

Department of Agricultural Research and Human Resource Development

ETHIOPIA

Addis Ababa University
Bureaus of Agriculture and Bureaus of Planning and Economic Development for the Tigray, Amhara, and Oromia regions
CARE-Ethiopia
Debre Zeit Agricultural Research Center (EARO-Debre Zeit)
Department of Plant Sciences, Alemaya University
Ethiopian Agricultural Research Organization
Ethiopian Development Research Institute
Ethiopian Economic Policy Research Institute
Ethiopian Grain Trade Enterprise
Mekelle University

GHANA

Crops Research Institute
Food Research Institute, Council for Scientific and Industrial Research
Ministry of Health
University for Development Studies
University of Ghana-Legon

KENYA

Kenya Agricultural Research Institute
Moi University
Resource Management and Policy Analysis Institute
University of Nairobi

MADAGASCAR

Centre National de Recherche Appliquée au Développement Rural

MALAWI

Bunda College of Agriculture
National Economic Council
National Statistical Office
Reserve Bank of Malawi
University of Malawi

MAURITIUS

Food and Agricultural Research Council

MOZAMBIQUE

CARE-Mozambique
Eduardo Mondlane University
Ministry of Health
Ministry of Planning and Finance
National Institute of Agronomic Research

NIGERIA

Ministry of Agriculture and Rural Development
University of Ibadan
University of Nigeria at Nsukka

SOUTH AFRICA

Data Research Africa
University of Natal, Durban
University of Pretoria

TANZANIA

Economic and Social Research Foundation
Ministry of Agriculture and Food Security
National Bureau of Statistics
Planning Commission, the President's Office
Tanzania Food and Nutrition Centre
University of Dar es Salaam

UGANDA

Africare-Uganda
Economic Policy Research Centre
Makerere Institute of Environment and Natural Resources
Makerere University
Ministry of Finance, Planning, and Economic Development
National Agricultural Research Organization
Research Department, Bank of Uganda
Uganda Coffee Development Authority

ZAMBIA

Soils and Crops Research Branch

ZIMBABWE

Ministry of Lands, Agriculture, and Rural Settlement
University of Zimbabwe

ASIA

BANGLADESH

Bangladesh Institute of Development Studies
Bangladesh Rice Research Institute
CARE-Bangladesh
Data Analysis and Technical Assistance
Ministry of Food
University of Dhaka

BHUTAN

Ministry of Agriculture

CHINA

Association of Deans of Agricultural Economics
Chinese Academy of Sciences
Institute of Agricultural Economics
State Development and Planning Commission

INDIA

Center for Economics and Social Studies
Indian Agricultural Research Institute
Indian Council of Agricultural Research
Indian Council for Research on International Economic Relations
Indian Institute of Management-Ahmedabad
Indira Gandhi Institute of Development Research
Jawaharlal Nehru University
Madras School of Economics
National Center for Agricultural Economics and Policy
National Institute for Rural Development
National Institute of Science, Technology, and Development Studies
Tamil Nadu Agricultural University

INDONESIA

Center for International Forestry Research
 Centre for Agro-Socio Economic Research
 Institute for Economic and Social Research, University of Indonesia
 Ministry of Agriculture
 Perum Jasa Tirta I Public Corporation
 Research Institute for Food Crops Biotechnology
 Research Institute for Rice
 Ministry for Settlement and Regional Infrastructure

NEPAL

Freeddeal

THE PHILIPPINES

Philippine Institute of Development Studies
 Philippine Rice Research Institute
 University of the Philippines, Los Baños

THAILAND

Thai Development Research Institute

VIET NAM

Cuu Long Delta Rice Research Institute
 Development Strategy Institute, Ministry of Planning and Investment
 General Statistics Office
 Ministry of Agriculture and Rural Development
 Sub-National Institute for Water Resource Planning
 Sub-National Institute of Forest Inventory and Planning
 Sub-National Institute for Agricultural Planning and Projection

LATIN AMERICA AND THE CARIBBEAN**ARGENTINA**

Secretaría de Agricultura, Ganadería, Pesca y Alimentación

BOLIVIA

Unidad de Análisis de Políticas Económicas

BRAZIL

Empresa Brasileira de Pesquisa Agropecuária
 Instituto de Pesquisa Econômica Aplicada
 University of São Paulo

CHILE

Catholic University
 Comisión Económica para América Latina
 Instituto de Investigaciones Agropecuarias
 Ministry of Agriculture

COLOMBIA

Ministry of Agriculture

COSTA RICA

Ministry of Agriculture
 Ministry of the Environment
 ProDesarrollo Internacional

CUBA

Instituto Nacional de Investigaciones Económicas

DOMINICAN REPUBLIC

Fundación Economía y Desarrollo

ECUADOR

Sistema Integrado de Indicadores Sociales del Ecuador

EL SALVADOR

Fundación Salvadoreña para el Desarrollo Económico y Social

GUATEMALA

Institute of Nutrition of Central America and Panama

HONDURAS

Cosecha
 Centre for Human Development (PROCONDEMA)
 Christian Organization for the Integrated Development of Honduras
 Empresa de Consultores Hondureños para el Desarrollo y la Protección del Ambiente
 ESA Consultants
 FAO Lempira Sur Project
 Foundation for Development of Rural Enterprises
 Honduran Agricultural Investigation Foundation
 Honduran Foundation for Agricultural Research
 National Program for the Sustainable Rural Development of Honduras
 National Statistical Institute
 Office of the 2000 Census
 Secretariat of Agriculture and Livestock
 University of the Atlantic Region

JAMAICA

University of the West Indies, Mona

MEXICO

Colegio de México
 Escuela Nacional de Antropología e Historia
 Instituto Nacional de Investigaciones Forestales, Agrícolas y Pecuarias
 Universidad Nacional Autónoma de México

NICARAGUA

Red de Protección Social, Government of Nicaragua

PERU

CARE-Peru
 Catholic University of Peru
 Grupo de Análisis para el Desarrollo
 La Molina National Agrarian University

URUGUAY

Centro de Investigaciones Económicas

VENEZUELA

Ministerio de la Producción y del Comercio
 Oficina de Asesoría Económica Asamblea Nacional
 Sistema Económico Latinoamericano

NORTH AFRICA/MIDDLE EAST**EGYPT**

Agricultural Research Centre

SUDAN

Agricultural Research Corporation

TUNISIA

Institut d'Economie Quantitative, Ministry of Economic Development

TURKEY

Bilkent University

COLLABORATING INSTITUTIONS IN DEVELOPED COUNTRIES

ASIA/PACIFIC

AUSTRALIA

Australian Centre for International Agricultural Research
 Australian National University
 Center for the Application of Molecular Biology to International Agriculture
 University of Adelaide
 University of Melbourne
 University of Western Australia

JAPAN

Foundation for Advanced Study in International Development
 Japan Bank for International Cooperation
 Tokyo Metropolitan University

EUROPE

BELGIUM

Université Libre de Bruxelles

DENMARK

Danish Institute of Agricultural and Fisheries Economics
 Royal Veterinary and Agricultural University
 University of Copenhagen

FRANCE

Centre de Coopération Internationale en Recherche Agronomique pour le Développement

GERMANY

Centre for Development Research (ZEF), University of Bonn
 German Agency for Technical Cooperation (GTZ)
 University of Hohenheim
 University of Kiel

ITALY

Istituto di Studi Economici e Sociali
 University of Rome

THE NETHERLANDS

Institute of Social Studies
 Wageningen University and Research Centre

NORWAY

Agricultural University of Norway
 University of Science and Technology

UNITED KINGDOM

Oxford University
 Department for International Development
 Imperial College
 International Institute of Environment and Development
 London School of Economics
 Sheffield University
 WRENmedia

NORTH AMERICA

CANADA

International Institute for Sustainable Development
 University of Saskatchewan

UNITED STATES

American Agricultural Economics Association
 Bread for the World
 CARE-U.S.A.
 Columbia University
 Congressional Hunger Center
 Cornell University
 Economic Research Service, U.S. Department of Agriculture
 Emory University
 Foreign Agricultural Service, U.S. Department of Agriculture
 International Center for Research on Women
 Institute for International Economics
 Iowa State University
 Kansas State University
 Macro International
 Montana State University
 National Oceanic and Atmospheric Administration
 Purdue University
 Stanford University
 Tufts University
 U.S. Agency for International Development
 U.S. Naval Academy
 University of California, Berkeley
 University of California, Davis
 University of California, Los Angeles
 University of California, San Diego
 University of Houston
 University of Kentucky
 University of Maryland
 University of Miami
 University of Minnesota
 University of Wisconsin
 Woodrow Wilson International Center for Scholars, Smithsonian Institution
 World Resources Institute

COLLABORATING INTERNATIONAL AND REGIONAL ORGANIZATIONS

Agricultural Policy Analysis Network for Latin America and Caribbean
 Asian Development Bank
 Association for Strengthening Agricultural Research in East and Central Africa
 Center for International Forestry Research
 Centro Internacional de Agricultura Tropical
 Centro Internacional de Mejoramiento de Maíz y Trigo
 Centro Internacional de la Papa
 Eastern and Central Africa Program for Agricultural Policy Analysis
 Food and Agriculture Organization of the United Nations
 Food Security Network for West Africa
 Foodnet
 Global Development Network
 ICLARM—The World Fish Center
 Inter-American Development Bank
 Interamerican Institute for Cooperation in Agriculture
 International Center for Agricultural Research in the Dry Areas

International Centre for Research in Agroforestry
 International Crops Research Institute for the Semi-Arid Tropics
 International Fertilizer Development Center
 International Institute for Environment and Development
 International Institute for Rural Reconstruction
 International Institute for Sustainable Development
 International Institute of Applied Systems Analysis
 International Institute of Tropical Agriculture
 International Livestock Research Institute
 International Plant Genetic Resources Institute
 International Rice Research Institute
 International Service for National Agricultural Research
 International Soil Reference and Information Centre
 International Water Management Institute
 Millennium Ecosystem Assessment
 North American Agricultural Economics Association
 Organization for Economic Co-operation and Development
 Regional Fund for Agricultural Technology
 South Asian Association for Regional Cooperation
 South Asian Network for Development and Environmental Economics
 United National Conference on Trade and Development
 United Nations Children's Fund
 United Nations Development Programme
 United Nations Economic Commission for Africa
 United Nations Population Fund
 United Nations Subcommittee on Nutrition
 United Nations University (Food and Nutrition Bulletin)
 West Africa Rice Development Association
 Winrock International
 World Bank
 World Meteorological Organization

COLLABORATION WITH INDIVIDUALS

IFPRI works with individuals as well as with institutions. These collaborations benefit IFPRI as well as the individuals and the institutions with which they are affiliated. In 2001, IFPRI researchers worked with the persons listed below.

Hezekiah O. Agwara, University of Nairobi, Kenya
 Haidari K. R. Amani, Economic and Social Research Foundation, Tanzania
 Gbolagade Ayoola, University of Agriculture Makurdi, Nigeria
 Theodora S. Ayuha, Makerere University, Uganda
 Godfrey Bahigwa, Economic Policy Research Center, Uganda
 J. W. Banda, Bunda College of Agriculture, University of Malawi
 Sibho Banda, University College of Cork, National University of Ireland
 Richard Barichello, University of British Columbia, Canada
 Abdoul Barry, Associates for International Resources and Development, U.S.A.
 Suraiya Begum, Center for Social Studies, Dhaka University, Bangladesh
 Jere Behrman, University of Pennsylvania, U.S.A.
 Tenkir Bongor, Ethiopian Development Research Institute
 Michael Bourdillon, University of Zimbabwe
 Sango Danford, Sokoine University of Agriculture, Tanzania
 Mulat Demeke, Addis Ababa University, Ethiopia
 Marcel Fafchamps, Centre for the Study of African Economies, University of Oxford, United Kingdom
 Kithiira Florence, Kenyatta University, Kenya
 Workeneh Gebresilassie, Addis Ababa University, Ethiopia
 Baye Berihum Getahun, Alemaya University, Ethiopia
 Kelly Hallman, Population Council, U.S.A.

Gamini Herath, La Trobe University, Australia
 John Hoddinott, Dalhousie University, Canada
 Mbogha Johnson, Makerere Institute of Social Research, Uganda
 David Muturi Kabiru, Ministry of Public Works and Housing, Uganda
 Stephen Njuguna Karingi, Kenya Institute for Public Policy Research and Analysis
 Joseph T. Karugia, University of Nairobi, Kenya
 Emmanuel Kaunda, Bunda College of Agriculture, University of Malawi
 Bill Kinsey, Free University, Netherlands
 Paul Guthiga Maina, University of Nairobi, Kenya
 Michelle Marra, North Carolina State University, U.S.A.
 Charles Mataya, Bunda College of Agriculture, University of Malawi
 Alex McCalla, University of California-Davis, U.S.A.
 Rajesh Mehta, Research and Information System for Non-Aligned and Other Developing Countries, India
 Richard Meyer, Ohio State University, U.S.A.
 Paulo Mole, Universidade Eduardo Mondlane, Mozambique
 Richard Mukasa, Makerere University, Uganda
 Harris Mutio Mule, Top Investment and Management Services, Ltd., Kenya
 Milu Muyanga, Ministry of Finance and Planning, Kenya
 Stella Nagujja, Makerere University, Uganda
 Margaret Ngigi, Egerton University, Kenya
 David Norman, Kansas State University, U.S.A.
 Felix Nweke, Michigan State University, U.S.A.
 Hezron Nyangito, Kenya Institute for Public Policy Research and Analysis
 Michael Nyirenda, Bunda College of Agriculture, University of Malawi
 Paul Omondi Obunde, Ministry of Agriculture and Rural Development, Kenya
 Marios Obwona, Economic Policy Research Centre, Uganda
 Beatrice Okello, Ministry of Agriculture, Uganda
 John Omiti, Institute of Policy Analysis and Research, Ethiopia
 Hellen Ommeh, University of Nairobi, Kenya
 Mary Omosa, Institute of Development Studies, University of Nairobi, Kenya
 Trudy Owens, University of Oxford, United Kingdom
 Robert Paarlberg, Wellesley College, U.S.A.
 César L. Revoredo, University of Georgia, U.S.A.
 Luis Romano, (formerly of the Instituto Colombiano Agropecuario), Colombia
 Dennis C. Rweyemamu, Economic and Social Research Foundation, Tanzania
 Ebbe Schiøler, Denmark
 Samuel Semanda, Ministry of Agriculture, Animal Industry, and Fisheries, Uganda
 Hannington Sengendo, Makerere University, Uganda
 Dick Sserunkuuma, Makerere University, Uganda
 Alemayehu Seyoum Taffesse, United Nations Economic Commission for Africa, Ethiopia
 Sukhadeo Thorat, School of Social Sciences, Jawaharlal Nehru University, India
 Juliet Wanjiki, University of Nairobi, Kenya
 Marcel Niyungi Bin Yungi, Kenya
 Manfred Zeller, University of Göttingen, Germany

PUBLICATIONS

2001

RESEARCH REPORTS

Number 116

Access to Credit and Its Impact on Welfare in Malawi, by Aliou Diagne and Manfred Zeller.

Number 117

Structural Adjustment and Intersectoral Shifts in Tanzania: A Computable General Equilibrium Analysis, by Peter Wobst.

Number 118

Seasonal Malnutrition in Rural Ethiopia: Magnitude, Correlates, and Functional Significance, by Anna Ferro-Luzzi, Saul S. Morris, Samson Taffesse, Tsegaye Demissie, and Maurizio D'Amato.

Number 119

The Egyptian Food Subsidy System: Structure, Performance, and Options for Reform, by Akhter U. Ahmed, Howarth E. Bouis, Tamar Gutner, and Hans Lofgren.

Number 120

Group-based Financial Institutions for the Rural Poor in Bangladesh: An Institutional- and Household-level Analysis, by Manfred Zeller, Manohar Sharma, Akhter U. Ahmed, and Shahidur Rashid.

Number 121

Land, Trees, and Women: Evolution of Land Tenure Institutions in Western Ghana and Sumatra, by Agnes R. Quisumbing and Keijiro Otsuka with S. Suyanto, J. B. Aidoo, and E. Payongayong.

Number 122

The 1998 Floods in Bangladesh: Disaster Impacts, Household Coping Strategies, and Response, by Carlo del Ninno, Paul A. Dorosh, Lisa C. Smith, and Dilip K. Roy.

Number 123

Natural Resource Management in the Hillsides of Honduras: Bioeconomic Modeling at the Microwatershed Level, by Bruno Barbier and Gilles Bergeron.

Number 124

Market Institutions, Transaction Costs, and Social Capital in the Ethiopian Grain Market, by Eleni Z. Gabre-Madhin.

Policy implications of each research report are summarized in the two-page IFPRI Abstract series, which is published in English, French, and Spanish.

IFPRI/JOHNS HOPKINS UNIVERSITY PRESS BOOKS

Agricultural Science Policy: Changing Global Agendas, edited by Julian M. Alston, Philip G. Pardey, and Michael J. Taylor.

Land Tenure and Natural Resource Management: A Comparative Study of Agrarian Communities in Asia and Africa, edited by Keijiro Otsuka and Frank Place.

The Politics of Precaution: Genetically Modified Crops in Developing Countries, by Robert L. Paarlberg.

Seeds of Contention: World Hunger and the Global Controversy over GM Crops, by Per Pinstrup-Andersen and Ebbe Schiøler. (Also available in Chinese, Danish, and German from other publishers; forthcoming in Japanese.)

OTHER BOOKS AND REPORTS

Attacking the Double Burden of Malnutrition in Asia and the Pacific, by Stuart Gillespie and Lawrence Haddad. Asian Development Bank (ADB) Nutrition and Development Series No. 4. An ADB/IFPRI copublication.

The Future of Food: Biotechnology Markets and Policies in an International Setting, edited by Philip G. Pardey. IFPRI book distributed by Johns Hopkins University Press.

Methods for Rural Development Projects, edited by John Hoddinott. First volume in IFPRI's Food Security in Practice technical guide series.

FOOD POLICY REPORT

Slow Magic: Agricultural R&D a Century After Mendel, by Philip G. Pardey and Nienke M. Beintema.

FOOD POLICY REVIEW

Number 5

Can Food-Based Strategies Contribute to Reducing Vitamin A and Iron Deficiencies? A Review of Recent Evidence, by Marie T. Ruel.

FOOD POLICY STATEMENTS

Number 32

Agricultural Science Policy: Changing Global Agendas, by Julian M. Alston, Philip G. Pardey, and Michael J. Taylor.

Number 33

Seeds of Contention: World Hunger and the Global Controversy over GM Crops, by Per Pinstrup-Andersen and Ebbe Schiøler.

Number 34

Land Tenure and Natural Resource Management: A Comparative Study of Agrarian Communities in Asia and Africa, by Keijiro Otsuka and Frank Place.

Number 35

The Politics of Precaution: Genetically Modified Crops in Developing Countries, by Robert L. Paarlberg.

Number 36

Slow Magic: Agricultural R&D a Century After Mendel, by Philip G. Pardey and Nienke M. Beintema.

GENERAL INFORMATION

Markets and Structural Studies (available in English and Spanish).

Trade and Macroeconomics (available in English and Spanish).

Training and Capacity Strengthening for Policy Research.

ISSUE BRIEF

Food for Education: Feeding Minds Reduces Poverty, plus insert, *Food for Schooling in Bangladesh*.

IFPRI PERSPECTIVES (Newsletter)

Volume 23 (English, French, Spanish)

Thinking through Globalization
First Quarter 2001

Breaking the Cycle of Rural Poverty in Mexico
Fourth Quarter 2001

A 2020 VISION FOR FOOD, AGRICULTURE, AND THE ENVIRONMENT**Books and Booklet**

Global Food Projections to 2020: Emerging Trends and Alternative Futures, by Mark W. Rosegrant, Michael S. Paisner, Siet Meijer, and Julie Witcover. 2020 Vision report.

The Unfinished Agenda: Perspectives on Overcoming Hunger, Poverty, and Environmental Degradation, edited by Per Pinstrup-Andersen and Rajul Pandya-Lorch.

Who Will Be Fed in the 21st Century? Challenges for Science and Policy, edited by Keith Wiebe, Nicole Ballenger, and Per Pinstrup-Andersen. IFPRI/2020 book distributed by Johns Hopkins University Press.

A Better World in 2020: Wake-Up Calls from the Next Generation, a compilation of essays, poetry, and art from the 2020 Vision Initiative youth essay and poster competition.

Discussion Papers**Number 34**

Agricultural Research and Poverty Reduction, by Peter Hazell and Lawrence Haddad.

Number 35

Prospects for Global Food Security: A Critical Appraisal of Past Projections and Predictions, by Alex F. McCalla and Cesar L. Revoredo.

Briefs**Number 69**

Transforming the Rural Asian Economy: The Unfinished Revolution, by Mark W. Rosegrant and Peter B. R. Hazell. (Also available in Spanish.)

Number 70

Agricultural Research and Poverty Reduction, by Peter Hazell and Lawrence Haddad. (Also available in Spanish.)

Number 71

Prospects for Global Food Security: A Critical Appraisal of Past Projections and Predictions, by Alex F. McCalla and César L. Revoredo. (Also available in Spanish.)

Food Policy Report

2020 Global Food Outlook: Trends, Alternatives, and Choices, by Mark W. Rosegrant, Michael S. Paisner, Siet Meijer, and Julie Witcover.

Focus Briefs**Number 5**

Health and Nutrition: Emerging and Reemerging Issues in Developing Countries, edited by Rafael Flores and Stuart Gillespie. (11 briefs)

Number 6

Empowering Women to Achieve Food Security, edited by Agnes R. Quisumbing and Ruth S. Meinzen-Dick. (12 briefs)

Number 7

Appropriate Technology for Sustainable Food Security, edited by Per Pinstrup-Andersen. (9 briefs)

Number 8

Shaping Globalization for Poverty Alleviation and Food Security, edited by Eugenio Díaz-Bonilla and Sherman Robinson. (13 briefs)

Number 9

Overcoming Water Scarcity and Quality Constraints, edited by Ruth S. Meinzen-Dick and Mark W. Rosegrant. (14 briefs)

News & Views (Newsletter, in English and Spanish)

Global Warming Changes the Forecast for Agriculture
April 2001

Feeding the Whole World Safely
August 2001

Articulating a Food-Secure Future
December 2001

OTHER PUBLISHED WORKS BY IFPRI STAFF IN 2001

Ahmed, Raisuddin. *The Retrospects and Prospects of the Rice Economy of Bangladesh*. Dhaka, Bangladesh: University Press Limited.

Babu, Suresh. Food and Nutrition Policies in Africa—Capacity Challenges and Training Options. *African Journal of Food and Nutritional Sciences* 1 (No. 1).

Babu, Suresh (with Valerie Rhoe). Capacity Strengthening in Environmental and Natural Resource Policy: Lessons from Malawi. *Findings*. Washington, D.C.: World Bank.

Babu, Suresh. Globalization and Agricultural Policies in India. *Annual Survey of Indian Agriculture—2001*. Chennai: The Hindu Publications.

Babu, Suresh (with G. Kumar). Supply Response under Market Liberalization: A Case Study of Malawian Agriculture. *Development South Africa* 18 (No. 1).

Beintema, Nienke (with A. Dias Avila and Philip Pardey). *Agricultural R&D in Brazil: Policy, Investments, and Institutional Profile*. Washington, D.C.: IFPRI, Embrapa, and FONTAGRO.

Bolwig, Simon. The Dynamics of Inequality in the Sahel: Agricultural Productivity, Income Diversification, and Food Security Among the Fulani Rimaibe in Northern Burkina Faso. In *Politics, Property and Production in the West African Sahel: Understanding Natural Resource Management*, ed. T. A. Benjaminsen and C. Lund. Uppsala: Nordiska Afrikainstitutet.

Bouis, Howarth (with A. Bhargava and N. Scrimshaw). Dietary Intakes and Socioeconomic Factors Are Associated with the Hemoglobin Concentration of Bangladeshi Women. *Journal of Nutrition* 131 (No. 3).

Bouis, Howarth (with R. Graham and R. Welch). Addressing Micronutrient Malnutrition through the Nutritional Quality of Staple Foods: Principles, Perspectives, and Knowledge Gaps. *Advances in Agronomy* 70.

Bouis, Howarth (with J. Huang). Structural Changes in the Demand for Food in Asia: Empirical Evidence for Taiwan. *Agricultural Economics* 26.

Cai, Ximing (with D. McKinney and L. Lasdon). Piece-by-Piece Approach for Solving Large Nonlinear Water Resources Management Model. *Journal of Water Resources Planning and Management* 127 (No. 6).

Cai, Ximing (with D. McKinney and L. Lasdon). Solving Nonlinear Water Management Models Using a Combined Genetic Algorithm and Linear Programming Approach. *Advances in Water Resources* 24 (No. 6).

Cai, Ximing (with Claudia Ringler and Mark Rosegrant). Examining Physical and Economic Efficiencies of Water Use at the River Basin Scale through Integrated Economic-Hydrologic Water Modeling. In *Integrated Water Resources Management*, ed. M. A. Marino and S. P. Simonovic. International Association of Hydrologic Science (IAHS) Publication No. 272.

Cai, Ximing (with D. McKinney, L. Lasdon, and D. Watkins). Solving Large Nonconvex Water Resources Management Models Using Generalized Benders Decomposition. *Operations Research (INFORMS)* 49 (No. 2).

Cohen, Marc (with E. Messer and T. Marchione). Conflict: A Cause and Effect of Hunger. *Entwicklung + Ländlicher Raum* 8 (No. 1). French translation published in *Agriculture + Rural Development* 8 (No. 2).

Cohen, Marc (with E. Messer and T. Marchione). Conflict: A Cause and Effect of Hunger. *Field Exchange*. Dublin, Ireland: Emergency Nutrition Network, Trinity College. Available at <http://www.ennonline.net/fex/12/rs9.h_l>.

Cohen, Marc (with E. Messer and T. Marchione). Conflict: A Cause and Effect of Hunger. *Environmental Change and Security Project Report* 7.

Delgado, Christopher. The Livestock Revolution. *The Chronicle of Higher Education* December 14.

Delgado, Christopher (with S. Ngqangweni and J. Kirsten). How Efficient Are African Smallholders? A Case Study in the Eastern Cape Province of South Africa. *Agrekon* 40 (No. 1).

Delgado, Christopher (with Mark Rosegrant and Siet Meijer). Livestock to 2020: The Revolution Continues. Proceedings of a symposium sponsored by the International Agricultural Trade Research Consortium, *International Trade in Livestock Products*, Auckland, New Zealand, January 18–19, 2001. (CD-ROM). Available at <www.iatrc.org-publications-proceedings>.

Delgado, Christopher (with M. Ahmed). Introduction to the Issues and Context of Rapid Changes in World Demand for Fish. Proceedings of the biennial meetings of the International Institute of Fisheries Economics and Trade, *IIFET2000: Microbehavior and Macroresults*, Corvallis, Oregon, U.S.A., July 10–14, 2000, Oregon State University (CD-ROM).

Delgado, Christopher (with C. Courbois, Mark Rosegrant, and M. Ahmed). Issues in Modeling Fish to 2020 within a Global Food Model. Proceedings of the biennial meetings of the International Institute of Fisheries Economics and Trade, *IIFET2000: Microbehavior and Macroresults*, Corvallis, Oregon, U.S.A., July 10–14, 2000, Oregon State University (CD-ROM).

Delgado, Christopher (with Mark Rosegrant, H. Steinfeld, S. Ehui, and C. Courbois). Livestock to 2020: The Next Food Revolution. *Outlook on Agriculture* 30 (No. 1).

Delgado, Christopher (with Mark Rosegrant, H. Steinfeld, S. Ehui, and C. Courbois). Livestock to 2020: The Next Food Revolution (Japanese translation). Tokyo: Japan Livestock Technology Association.

del Ninno, Carlo (with Paul Dorosh). Averting a Food Crisis: Private Imports and Public Targeted Distribution in Bangladesh after the 1998 Flood. *Agricultural Economics* 25.

Diao, Xinshen (with H. Colby and F. Tuan). China's WTO Accession: Conflicts with Domestic Agricultural Policies and Institutions. *The Estey Center Journal of International Law and Trade Policy* 2 (No. 1). Also translated into Chinese and published by three Chinese Journals.

Diao, Xinshen (with A. Somwaru). A Dynamic Evaluation of the Effects of a Free-Trade Area of the Americas—An Intertemporal, Global General Equilibrium Model. *Journal of Regional Integration* 16 (No. 1).

Diao, Xinshen (with E. Yeldan). Turkey's Strategic Trade Policy Alternatives in a World of Multi-Polar Trade Blocs: Lessons from an Intertemporal, Multi-Region General Equilibrium Model. In *Regionalism in Europe, Geometries and Strategies after 2000*, ed. J. Hagen and M. Wüdgren. Boston, Massachusetts, U.S.A.: Kluwer Academic Publishers.

Diao, Xinshen (with J. Dyck and A. Somwaru). Can Reindustrialization of North Korea Support a Sustainable Food Supply? In *Perspectives on Korean Unification and Economic Integration*, ed. Y. Choi et al. Northampton, Massachusetts, U.S.A.: Edward Elgar.

Diao, Xinshen (with J. Dyck and A. Somwaru). *Structural Change and Agricultural Protection: The Costs of Korean Agricultural Policy 1975 and 1990*. Agriculture Economic Reports. Washington, D.C.: Economic Research Service, U.S. Department of Agriculture.

Diao, Xinshen (with T. Roe and A. Somwaru). A Global Analysis of Agricultural Reform in WTO Member Countries. In *Agricultural Policy Reform in the WTO, The Road Ahead*. Agricultural Economic Report No. 802. Washington, D.C.: Economic Research Service, U.S. Department of Agriculture.

Diao, Xinshen (with T. Roe and A. Somwaru). What Is the Cause of Growth in Regional Trade: Trade Liberalization or RTAs? The Case of Agriculture. *The World Economy* 24 (No. 1).

Díaz-Bonilla, Eugenio. Commentary. *The Latin America Advisor Newsletter* (September 27).

Díaz-Bonilla, Eugenio. Globalization and Agriculture: Some Facts, Interpretations, and Policy Issues. In *Globalization and the Rural Environment*, ed. O. Solbrig, R. Paarlberg, and F. di Castri. The David Rockefeller Center Series on Latin American Studies. Cambridge, Massachusetts, U.S.A.: Harvard University Press.

Díaz-Bonilla, Eugenio (with H. Schamis). From Redistribution to Stability: The Evolution of Exchange Rate Policies in Argentina, 1950–98. In *The Currency Game: Exchange Rate Politics in Latin America*, ed. J. Frieden and E. Stein. Washington, D.C.: The Johns Hopkins University Press and Inter-American Development Bank.

Díaz-Bonilla, Eugenio (with Sherman Robinson). WTO Can Help World's Poor Farmers. *The International Herald Tribune* (March 28).

Díaz-Bonilla, Eugenio (with Marcelle Thomas). Trade Liberalization, WTO, and Food Security. In *Leveraging Trade and Global Market Integration for Poverty Reduction*, proceedings of a World Bank conference, July 23–24, 2001. Washington, D.C.: World Bank.

Dorosh, Paul. Trade Liberalization and National Food Security: Rice Trade between Bangladesh and India. *World Development*. 29 (No. 4).

Dorosh, Paul (with Q. Shahabuddin). *Towards Comprehensive Food Security in Bangladesh: New Research on Availability, Access, and Nutrition*. Proceedings of the third annual workshop of the Food Management and Research Support Project (FMRSP), held February 6 and 12, 2001. Dhaka, Bangladesh: FMRSP-IFPRI.

Fan, Shenggen (with Peter Hazell). Returns to Public Investments in the Less-Favored Areas of India and China. *American Journal of Agricultural Economics*, 83 (No. 5).

Fan, Shenggen (with L. Zhang and Xiaobo Zhang). Growth and Poverty in Rural China: The Role of Public Investment (in Chinese). *World Economy* (October).

Fan, Shenggen (with L. Zhang and Xiaobo Zhang). Public Spending Spurs Growth. *China Daily* (August 16).

Gabre-Madhin, Eleni. The Role of Intermediaries in Enhancing Market Efficiency in the Ethiopian Grain Market. *Agricultural Economics* 25 (September).

Gabre-Madhin, Eleni (with M. Fafchamps). Agricultural Markets in Benin and Malawi: The Operation and Performance of Traders. *World Bank Policy Research Working Paper No. 2734* (December).

Garrett, James (with Marie Ruel). Stunted Child-Overweight Mother Pairs: An Emerging Policy Concern? *Annals of Nutrition and Metabolism* 45 (suppl. 1) (abstract 6.02.108).

Gillespie, Stuart (with Lawrence Haddad). *Attacking the Double Burden of Malnutrition in Asia and the Pacific*. Manila, Philippines: Asian Development Bank.

Gillespie, Stuart (with Lindsay Allen) What Works? A Review of the Efficacy and Effectiveness of Nutrition Interventions. Manila, Philippines: United Nations Sub-Committee on Nutrition (ACC/SCN) and the Asian Development Bank.

Gillespie, Stuart (with L. Haddad and R. Jackson). HIV/AIDS and Food Security: Impacts and Actions. In ACC/SCN Nutrition Policy Paper No. 20. Geneva: United Nations Sub-Committee on Nutrition (ACC/SCN).

Gulati, Ashok. Indian Agriculture and the WTO: Preparing for the New Millennium. In *WTO and the Indian Economy*, ed. G. K. Chadha. New Delhi: Deep and Deep Publications.

Gulati, Ashok (with S. Bathla). Capital Formation in Indian Agriculture: Revisiting the Debate. *Economic and Political Weekly* 26 (No. 20).

Haddad, Lawrence (with Stuart Gillespie). Effective Food and Nutrition Policy Responses to HIV/AIDS: What We Know and What We Need to Know. *Journal of International Development* 13.

Hazell, Peter. Agricultural Growth, Poverty, and the Environment. In *Sustainability of Agricultural Systems in Transition*, ed. William Payne, Dennis Keeney, and Srinivas Rao. Madison, Wisconsin, U.S.A.: American Society of Agronomy.

Hazell, Peter (with G. Bhalla). Can India Continue to Feed Herself? In *Sustainability of Agricultural Systems in Transition*, ed. William Payne, Dennis Keeney, and Srinivas Rao. Madison, Wisconsin, U.S.A.: American Society of Agronomy.

Jagger, Pam (with John Pender). Markets, Marketing, and Production—Issues for Aquaculture in East Africa: The Case of Uganda. *Naga—The ICLARM Quarterly* 24 (Nos. 1 and 2).

Jansen, Hans. Recapitulating a Decade of Collaborative Land Use in Costa Rica. Presentation at the CGIAR Conference on Integrated Management for Sustainable Agriculture, Forestry and Fisheries, held at CIAT, Cali, Colombia, 28-31 August 2001.

Jansen, Hans. Síntesis de una década de investigación en el análisis del uso de la tierra a diferentes escalas en Costa Rica. Invited keynote address at the Expo 2001 event, University of Costa Rica (UCR), August 24, 2001, San José, Costa Rica.

Jansen, Hans (with R. A. Schipper, B. A. M. Bouman, A. Nieuwenhuys, and H. Hengsdijk). Evaluation of Land Use Policies using Integrated Bio-economic Models: Application to Costa Rica. In *Tradeoffs or Synergies? Agricultural Intensification, Economic Development and the Environment*, ed. David R. Lee and Christopher B. Barrett. Wallingford, U.K.: CAB International.

Jansen, Hans (with R. A. Schipper, P. Roebeling, E. H. Bulte, H. Hengsdijk, B. A. M. Bouman, and A. Nieuwenhuys). Alternative Approaches to the Economics of Soil Nutrient Depletion in Costa Rica: Exploratory, Predictive and Normative Bio-economic Models. In *Economic Policy and Sustainable Land Use: Recent Advances in Quantitative Analysis for Developing Countries*, ed. N. Heerink, H. van Keulen, and M. Kuiper. New York: Physica-Verlag: Heidelberg.

Löfgren, Hans (with Moataz El-Said). Food Subsidies in Egypt: Reform Options, Distribution, and Welfare. *Food Policy* 26.

Maluccio, John (with H. Alderman, J. Behrman, H.-P. Kohler, and S. Cotts Watkins). Attrition in Longitudinal Household Survey Data: Some Tests for Three Developing Country Samples. *Demographic Research* 5 (No. 4).

McCarthy, Nancy (with E. Sadoulet and A. de Janvry). Common Pool Resource Appropriation under Costly Cooperation. *Journal of Environmental Economics and Management* 42 (No. 3).

Meinzen-Dick, Ruth S. Shared Water Use in Irrigation Systems. *Agriculture and Rural Development* 5.

Meinzen-Dick, Ruth S., ed. Multiple Uses of Water in Irrigated Areas. *Irrigation and Drainage Systems* 5 (No. 2).

Meinzen-Dick, Ruth S. (with Margaretha Bakker). Water Rights and Multiple Water Uses: Issues and Examples from Kirindi Oya, Sri Lanka. *Irrigation and Drainage Systems* 15 (No. 2).

Meinzen-Dick, Ruth (with B. Bruns). Water Rights and Legal Pluralism: Four Contexts for Negotiation. *Natural Resources Forum* 25 (No. 1).

Meinzen-Dick, Ruth (with Rajendra Pradhan). Implications of Legal Pluralism for Natural Resource Management. *IDS Bulletin* 32 (No. 4).

Meinzen-Dick, Ruth (with M. Zwartveen). Gender Dimensions of Community Resource Management: The Case of Water Users' Associations in South Asia. In *Natural Communities? Ethnicity, Gender, and the State in Community-Based Conservation*, ed. C. C. Gibson and A. Agrawal. New Brunswick, New Jersey, U.S.A.: Rutgers University Press.

Meinzen-Dick, Ruth (with M. Zwartveen). Gender and Property Rights in the Commons: Examples of Water Rights in South Asia. *Agriculture and Human Values* 18 (No. 1).

Meinzen-Dick, Ruth (with Anna Knox and Monica Di Gregorio), eds. *Collective Action, Property Rights, and Devolution of Natural Resource Management—Exchange of Knowledge and Implications for Policy*. Proceedings of an international conference held in Puerto Azul, the Philippines, June 21–25, 1999. Feldafing, Germany: German Foundation for International Development.

Meinzen-Dick, Ruth (with G. Makombe, S. P. Davies, and R. K. Sampath). An Evaluation of *Bani (Dambo)* Systems as a Smallholder Irrigation Development Strategy in Zimbabwe. *Canadian Journal of Agricultural Economics* 49.

Meinzen-Dick, Ruth (with K. Palanisami). Tank Performance and Multiple Uses in Tamil Nadu, South India. *Irrigation and Drainage Systems* 15 (No. 2).

Morley, Samuel. *The Income Distribution Problem in Latin America and the Caribbean*. Santiago, Chile: CEPAL.

Morley, Samuel (with H. Escaith). The Impact of Structural Reforms on Growth in Latin America and the Caribbean: An Empirical Estimation. *El Trimestre Económico* 68 (No. 4).

Pandya-Lorch, Rajul. Policies to Stimulate Agricultural and Rural Growth. In *Villages in the Future: Crops, Jobs, and Livelihood*, ed. D. Virchow and J. von Braun. Heidelberg: Springer-Verlag.

Pandya-Lorch, Rajul (with P. Pinstrup-Andersen and M. W. Rosegrant). Prospects for Food Demand and Supply Toward 2020. In *Fertilizers and Resource Management for Food Security, Quality, and the Environment*, Proceedings of the 2001 Dahlia Greidinger Symposium. York, U.K.: The International Fertilizer Society.

Pardey, Philip (with J. Alston). Reassessing Research Returns: Attribution and Related Problems. *Agricultural Economics* 25 (Nos. 2-3).

Pardey, Philip (with J. Alston). Reassessing Research Returns: Attribution and Related Problems. In *Tomorrow's Agriculture: Incentives, Institutions, Infrastructure, and Innovations*. Proceedings of the 24th International Conference of Agricultural Economists, ed. G. Peters and P. Pingali. Aldershot, U.K.: Ashgate Publishing.

Pardey, Philip (with E. Binenbaum and B. Wright). Public-Private R&D Relationships: The Consultative Group on International Agricultural Research. *American Journal of Agricultural Economics* 83 (No. 3).

Pardey, Philip (with Bonwoo Koo, B. Wright, M. Van Dusen, B. Skovmand, and S. Taba). Costing the Conservation of Genetic Resources: CIMMYT's *Ex Situ* Maize and Wheat Collection. *Crop Science* 41 (No. 4).

Pender, John. Rural Population Growth, Agricultural Change, and Natural Resource Management in Developing Countries: A Review of Hypotheses and Some Evidence from Honduras. In *Population Matters, Demographic Change, Poverty, and Economic Growth in Developing Countries*, ed. N. Birsall, S. Sinding, and A. Kelly. Oxford: Oxford University Press.

Pender, John (with S. Benin). Impacts of Land Redistribution on Land Management and Productivity in the Ethiopian Highlands. *Land Degradation and Development* 12.

Pender, John (with S. Holden and B. Shiferaw). Market Imperfections and Land Productivity in the Ethiopian Highlands. *Journal of Agricultural Economics* 52 (No. 3).

Pender, John (with S. Scherr and G. Durón). Pathways of Development in the Hillsides of Honduras: Causes and Implications for Agricultural Production, Poverty, and Sustainable Resource Use. In *Tradeoffs or Synergies? Agricultural Intensification, Economic Development, and the Environment*, ed. D. Lee and C. Barrett. Wallingford, U.K.: CAB International.

Pender, John (with B. Gebremedhin, S. Benin, and S. Ehui). Strategies for Sustainable Agricultural Development in the Ethiopian Highlands. *American Journal of Agricultural Economics* (December).

Pinstrup-Andersen, Per. Balancing the Benefits of Biotechnology. *The Australian's Opinion* (January 23).

Pinstrup-Andersen, Per. Biotechnology, KVL, and the Developing Countries. *Annual Report 2000*. Frederiksberg, Denmark: KVL (The Royal Veterinary and Agricultural University).

Pinstrup-Andersen, Per. Feeding the World in the New Millennium: Issues for the New U.S. Administration. *Environment* 43 (July/August).

Pinstrup-Andersen, Per. Higher Crop Yields Needed for a Hungry World. *The Canberra Times* (January 18).

Pinstrup-Andersen, Per. La Recherche: Un Bien Public Mondial? *Agriculture + Développement Rural* 8 (No. 1).

Pinstrup-Andersen, Per. We Can Feed the Poor and Help the Earth through Agricultural Research. *Wisconsin State Journal* (April 22).

Pinstrup-Andersen, Per (with Julie Babinard). Globalization and Human Nutrition: Opportunities and Risks for the Poor in Developing Countries. *African Journal of Food and Nutritional Sciences* 1 (August 1).

Pinstrup-Andersen, Per (with Marc Cohen). Go Beyond Emergency Food Aid: Address the Underlying Causes of Hunger in Afghanistan. *Des Moines Register* (October 27).

Pinstrup-Andersen, Per (with Marc Cohen). Modern Agricultural Biotechnology and Developing Country Food Security. In *Genetically Modified Organisms in Agriculture: Economics and Politics*, ed. Gerald Nelson. London and San Diego, California, U.S.A.: Academic Press.

Quisumbing, Agnes (with Lawrence Haddad and C. Peña). Are Women Overrepresented among the Poor? An Analysis of Poverty in Ten Developing Countries. *Journal of Development Economics* 66 (No. 1).

Quisumbing, Agnes (with K. Otsuka). Land Inheritance and Schooling in Matrilineal Societies: Evidence from Sumatra. *World Development* 29 (No. 12).

Quisumbing, Agnes (with Ellen Payongayong, J. Aidoo, and K. Otsuka). Women's Land Rights in the Transition to Individualized Ownership: Implications for the Management of Tree Resources in Western Ghana. *Economic Development and Cultural Change* 50 (No. 1).

Quisumbing, Agnes (with J. Estudillo and K. Otsuka). Gender Differences in Land Inheritance, Schooling, and Lifetime Income: Evidence from the Rural Philippines. *Journal of Development Studies* 37 (No. 4).

Quisumbing, Agnes (with J. Estudillo and K. Otsuka). Gender Differences in Schooling and Land Inheritance in the Rural Philippines. *Land Economics* 77 (No. 1).

Quisumbing, Agnes (with J. Estudillo and K. Otsuka). Gender Differences in Wealth Transfers and Expenditure Allocation: Evidence from the Rural Philippines. *Developing Economies* 39 (No. 4).

Quisumbing, Agnes (with J. Estudillo and K. Otsuka). Income Distribution in Rice-Growing Villages during the Post-Green Revolution Periods: The Philippine Case, 1985 and 1998. *Agricultural Economics* 25 (No. 1).

Quisumbing, Agnes (with K. Otsuka). Land Rights and Natural Resource Management in the Transition to Individual Ownership. In *Access to Land, Rural Poverty, and Public Action*, ed. A. de Janvry, G. Gordillo, J.-P. Platteau, and E. Sadoulet. Oxford: Oxford University Press.

Rashid, Shahidur. Compact Township and Infrastructural Policies. *Asian Affairs*, Vol 22, No. 2, April-June 2001.

Ringler, Claudia. Optimal Water Allocation in the Mekong River Basin. ZEF Discussion Paper on Development Policy No. 38. Bonn: Centre for Development Research (ZEF).

Ringler, Claudia. Optimal Allocation and Use of Water Resources in the Mekong River Basin: Multi-Country and Intersectoral Analyses, Development Economics and Policy Series. Vol. 20. Frankfurt: Peter Lang.

Ringler, Claudia (with N. C. Cong, and N. V. Huy). Water Allocation and Use in the Dong Nai River Basin in the Context of Water Sector Reforms. In Documentation of Regional Workshop on Integrated Water Resources Management in a River Basin Context: Institutional Strategies for Improving the Productivity of Agricultural Water Management, Malang, Indonesia, January 15-19.

Robinson, Sherman (with R. Bautista, F. Tarp, and Peter Wobst). Policy Bias and Agriculture: Partial and General Equilibrium Measures. *Review of Development Economics* 5 (No. 1).

Robinson, Sherman (with M. Burfisher and K. Thierfelder). The Impact of NAFTA on the United States. *Journal of Economic Perspectives* 15 (No. 1).

Robinson, Sherman (with A. Cattaneo and Moataz El-Said). Updating and Estimating a Social Accounting Matrix Using Cross Entropy Methods. *Economic Systems Research* 13 (No. 1).

Robinson, Sherman (with C. Nielsen and K. Thierfelder). Genetic Engineering and Trade: Panacea or Dilemma for Developing Countries? *World Development* 29 (No. 8).

Rosegrant, Mark (with Ximing Cai). Water Scarcity and Food Security—Alternative Futures for the 21st Century. *Journal of Water Science and Technology* 43 (No. 4).

Rosegrant, Mark (with Michael Paisner and Claudia Ringler). Global and Southeast Asian Trends in Food Supply, Demand, and Food Security. Conference Proceedings. U.N. World Food Program. Phnom Penh, Cambodia, February 8-9, 2001.

Ruel, Marie. Do Subsidized Childcare Programs Work? An Operational Evaluation in Guatemala City. *Food and Agriculture Organization Journal* 29.

Ruel, Marie. The Natural History of Growth Failure: Importance of Intrauterine and Postnatal Periods. In *Nutrition and Growth*, ed. R. Martorell and F. Haschke. Vol. 47, Nestlé Nutrition Workshop Series, Pediatric Program. Philadelphia: Vevey/Lippincott Williams & Wilkins.

Ruel, Marie. Urbanización en América Latina: Limitaciones y oportunidades en la alimentación y en el cuidado de niñas y niños. In *Alimentos complementarios y procesados en América Latina. Resultados de una Consultoría Técnica de la Organización Panamericana de la Salud (OPS) y el Proyecto LINKAGES titulada: Alimentos complementarios procesados en América Latina: Por qué, dónde y cómo?* Washington, D.C.: Pan American Health Organization.

Ruel, Marie (with M. Armar-Klemesu). A Positive Deviance Approach to the Study of Child Feeding Practices and Care in Accra, Ghana. *Annals of Nutrition and Metabolism* 45 (suppl. 1) (abstract 6.05.1.011).

Ruel, Marie (with R. Borbolla, G. Pelto, and I. Brouwer). Identifying Sociocultural and Environmental Factors Related to Maternal Caring Behaviors and the Intake of Vitamin A and Iron-Rich Foods among Children 6–24 months in Yendi District, Northern Ghana. *Annals of Nutrition and Metabolism* 45 (suppl. 1) (abstract A.01.108).

Ruel, Marie (with Howarth Bouis). Food Modifications and Impact on Nutrition. In *Encyclopedia for Life Support Systems*. Oxford: Encyclopedia of Life Support Systems.

Ruel, Marie (with C. Levin). Food-Based Approaches. In *Nutritional Anemias*, ed. U. Ramakrishnan. Boca Raton, Florida, U.S.A.: CRC Press.

Ruel, Marie (with Lawrence Haddad and James Garrett). Rapid Urbanization and the Challenges of Obtaining Food and Nutrition Security. In *Nutrition and Health in Developing Countries*, ed. R. D. Semba and M. Bloem. Totowa, New Jersey, U.S.A.: Humana Press.

Ruel, Marie (with B. de la Brière, K. Hallman, Agnes Quisumbing, and M. Morfin). Nutritional Impact of a Government-Sponsored Community Day Care Program in Guatemala. *Annals of Nutrition and Metabolism* 45 (suppl. 1) (abstract 7.A4.014).

Ruel, Marie (with P. Menon). Towards the Development of a Child-Feeding Index: Using the Demographic and Health Surveys from Latin America to Quantify and Model Child-Feeding Practices. *Annals of Nutrition and Metabolism* 45 (suppl. 1) (abstract 6.05.1.121).

Sharma, Manohar (with G. Datt and D. Jolliffe). A Profile of Poverty in Egypt. *African Development Review* 13 (No. 2).

Skoufias, Emmanuel (with S. Parker). Conditional Cash Transfers and their Impact on Child Work and School Enrollment: Evidence from the PROGRESA Program in Mexico. *Economia* 2 (No. 1).

Skoufias, Emmanuel. Changes in Regional Inequality and Social Welfare in Indonesia between 1996 and 1998. *Journal of International Development* 13 (No. 1).

Skoufias, Emmanuel (with B. Davis and S. de la Vega). Targeting the Poor in Mexico: An Evaluation of the PROGRESA Selection Mechanism. *World Development* 29 (No. 10).

Smith, Lisa (with Lawrence Haddad). How Important Is Improving Food Availability for Reducing Child Malnutrition in Developing Countries? *Agricultural Economics* 26.

Zhang, Xiaobo. FDI and Regional Inequality. In *WTO and China: Development through Globalization*, ed. J. Wen, Z. Zheng, X. Wang, and X. Zuo. Beijing: China People's University Press.

Zhang, Xiaobo (with Shenggen Fan). Estimating Crop-Specific Production Technology in Chinese Agriculture: A Generalized Maximum Entropy Method. *American Journal of Agricultural Economics* 83 (No. 2).

Zhang, Xiaobo (with R. Kanbur). What Difference Do Polarisation Measures Make? *Journal of Development Studies* 37 (No. 3).

Zhang, Xiaobo (with T. Mount and R. Boisvert). The Demand for Food Grain in China: New Insights into a Controversy. *Agricultural and Resource Economics Review* 30 (No. 1).

SPECIAL REPORTS

A General Equilibrium Analysis of Tobacco in China. Prepared by Xinshen Diao and Sherman Robinson for the Trade and Commodities Division, Food and Agriculture Organization of the United Nations.

A General Equilibrium Analysis of Tobacco in Turkey. Prepared by Xinshen Diao for the Trade and Commodities Division, Food and Agriculture Organization of the United Nations.

A Multiple-Method Approach to Studying Childcare in an Urban Environment: The Case of Accra, Ghana. Prepared by Marie Ruel, M. Armar-Klemesu, and M. Arimond for Food and Nutrition Technical Assistance Project.

Assessing Care: Progress towards the Measurement of Selected Childcare and Feeding Practices, and Implications for Programs. Prepared by Marie Ruel and M. Arimond for Food and Nutrition Technical Assistance Project.

Assessing the Needs for Distance Delivery of Graduate Education in Agricultural Economics in East Africa. Prepared by Suresh Babu for the Distance Learning Vision Committee of the American Association of Agricultural Economics.

Assessment of Strategic Land Use Options for Uganda. Prepared by Simon Bolwig, Peter Hazell, and Stanley Wood for the U.S. Agency for International Development, Uganda Mission.

Decreasing Tobacco Prices and Malawi's Economic Adjustment. Prepared by Peter Wobst and Xinshen Diao for the Trade and Commodities Division, Food and Agriculture Organization of the United Nations.

Evaluating the Food for Education Program in Bangladesh. Prepared by Akhter Ahmed, Carlo del Ninno, and O. Chowdhury for U.S. Agency for International Development.

Economía de los Alimentos (Food Economics) Training Workshop. Prepared by Suresh Babu and Valerie Rhoe for the German Agency for Technical Cooperation (GTZ).

Food for Education Program in Bangladesh: An Evaluation of its Impact on Educational Attainment and Food Security. Prepared by Akhter Ahmed and Carlo del Ninno for the U.S. Agency for International Development.

Food Policy and Nutrition Security in Asia: Strategies and Policy Options. Prepared by Suresh Babu for the Asian Development Bank.

Food Security in Central Asia: Economic Opportunities, Policy Constraints, and Future Challenges. Prepared by Suresh Babu and Valerie Rhoe for the United Nations Conference on Trade and Development.

Governing Maintenance Provision in Irrigation: A Guide to Institutionally Viable Maintenance Strategies. Prepared by Walter Huppert, Mark Svendsen, and Douglas L. Vermillion with Birgitta Wolff, Martin Burton, Paul van Hofwegen, Ruth Meinzen-Dick, Waltina Scheumann, and Klaus Urban for the German Agency for Technical Cooperation (GTZ).

Lessons from the Urban Food-for-Work Program, CARE-Ethiopia: Notes and Observations. Prepared by James Garrett for CARE-U.S.A.

Loosing Ground? What's Happened with Agricultural Research Regarding Less Developed Countries. Prepared by Philip Pardey and Nienke Beintema for the United Nations Development Programme (UNDP).

Policy Analysis Using Economic Modeling of Production and Natural Resource Technologies. Training workshop prepared by Suresh Babu for Food Security Network for West Africa (SADAOC).

Poverty Measurement and Analysis. Training workshop prepared by Suresh Babu for German Agency for Technical Cooperation (GTZ), Peru.

Review of Health and Nutrition Education Messages and Delivery System Currently Used in Haiti, and Recommendations for Further Research. Prepared by Marie Ruel with P. Menon, G. Pelto and J.-H. Habicht for Food and Nutrition Technical Assistance Project.

Simulating a Decrease in the World Price of Tobacco within a CGE Framework: Results for Zimbabwe. Prepared by Marcelle Thomas and Xinshen Diao for the Trade and Commodities Division, Food and Agriculture Organization of the United Nations.

Training and Capacity for Food Policy Analysis under the Food Management Research Support Project (FMRSP). Prepared by Suresh Babu and R. Amin for the Ministry of Food, Bangladesh.

PERSONNEL

This list reflects personnel employed by IFPRI as of December 31, 2001, and includes part-time staff members. Country indicates citizenship of staff member.

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Head of Donor Relations

Stacy Roberts, U.S.A.

Program Analyst

Louise Heegaard, Denmark

Executive Secretary to the Director General

Edith Yalong, Philippines

Graphics Specialist

Vicki Lee, Philippines

Administrative Coordinator

Adwoa Boateng, Ghana

2020 Vision for Food, Agriculture, and the Environment Initiative

Head

Rajul Pandya-Lorch, Kenya

Coordinator, 2020 Vision Network for East Africa

Fred Opiyo, Uganda (outposted to Uganda)

Research Analyst

Simon Bolwig, Denmark (outposted to Uganda)

Administrative Coordinator

Jenna Kryszczun, U.S.A.

2020 Vision Network for East Africa Office Kampala, Uganda (locally recruited staff)

Research Analyst

Evelyn Apili, Uganda

Administrative Coordinator

Caroline Aguti, Uganda

Secretary

Linda Alum Odur, Uganda

Messengers/Cleaners

Deborah Ajalu, Uganda

RESEARCH AND OUTREACH

ENVIRONMENT AND PRODUCTION TECHNOLOGY DIVISION

Director

Peter Hazell, United Kingdom

Senior Research Fellows

Shenggen Fan, China

Ruth Meinzen-Dick, U.S.A.

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Yukitsugu Yanoma, Japan

Senior Administrative Coordinator

María Cohan, Argentina

Program Assistant

Florence Meria, Kenya

VISITING RESEARCHERS

Some 130 visitors spent time at IFPRI in 2001. Those listed here spent a month or more at IFPRI.

Dan Banik, University of Oslo, Norway
 Henning Tarp Jensen, University of Copenhagen, Denmark
 Stephanie Levy, University of Toulouse, France
 Hildegunn Stokke, Norwegian University of Science and Technology, Norway
 Mona Sur, University of Minnesota, U.S.A.
 Karen Thierfelder, U.S. Naval Academy, U.S.A.
 Espen Villanger, Norwegian School of Economics and Business Administration, Norway

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Publication Services

Senior Communications Specialist
 Evelyn Banda, U.S.A.

Desktop Publishing Specialist

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Publications Assistant

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Luz Marina Alvaré, Colombia

Librarian

Marie Hoffman, U.S.A.

Library Clerical Assistant

Amanda Segovia, Philippines

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Simone Hill Lee, U.S.A.

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Michael Rubinstein, U.S.A.

Communications Specialists

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 Michele Pietrowski, U.S.A.

Training for Capacity-Strengthening Program*Program Head and Senior Research Fellow*

Suresh Babu, India

Senior Research Assistant

Valerie Rhoe, U.S.A.

Program Assistant

Brenda Clark, U.S.A.

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Luisa Gaskell, Philippines

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Angelica Santos, Philippines

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Anthony Thomas, U.S.A.

Administrative Assistant

Yolanda Palis, Philippines

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Glen Briscoe, U.S.A.

Facilities Technician II

Melvin Suggs, U.S.A.

Receptionist

Rosa Gutierrez, U.S.A.

Computer Services*Head*

Nancy Walczak, U.S.A.

Senior Information Technology Professional

Kang Chiu, U.S.A.

Information Technology Professional

Aamir Qureshi, Pakistan

Information Technology Support

Jiun Heng, Malaysia

Kwong Hii, Malaysia

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James Fields, U.S.A.

Chief Accountant

German Gavino, U.S.A.

Staff Accountants

Howard Lee, U.S.A.

Paulina Manalansan, Philippines

Orlan Wilson, U.S.A.

Human Resources*Head*

Dianne Spivack, U.S.A.

Human Resources Assistant

Zeynep Bortbakan, Turkey

IFPRI in the Field

IFPRI staff travel frequently to attend conferences, present papers, and conduct fieldwork. But some IFPRI staff members also live and work at study sites as part of collaborative projects with institutions throughout the world. In 2001, nine IFPRI staff members lived and worked in developing countries: Bangladesh, Honduras, Indonesia, Uganda, and Viet Nam. One staff member lived and worked in Germany. Being on site enabled them to interact closely and intensively with local researchers. From their posts in the field, these staff had regular opportunities to share their skills in policy research and analysis and to learn from their peers in these countries.

IFPRI

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Trustees at the 2002 Board meeting in Costa Rica. From left: Rebeca Grynspan Mayufis, Geoff Miller, Wenche Barth Eide, Roberto E. Vázquez Platero, Sylvia Ostry, Per Pinstруп-Andersen, Frances Stewart, Wen Simei, Isher Judge Ahluwalia, Arie Kuyvenhoven. Not pictured: Baba Dioum, Susumu Matsuoka, Solita Collas Monsod, Mandivamba Rukuni, G. Edward Schuh.

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2001

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 World Vision

A word of thanks from IFPRI's director general

Without the financial support of our donors, the work summarized in this annual report would be impossible. On behalf of IFPRI, I would like to thank our donors for their commitment to the fight against global poverty and hunger.

I would also like to thank the many dedicated researchers who collaborated with us. They have greatly strengthened IFPRI's contribution to the global public good. (See page 82 for a list of our collaborators in 2001.)

The many farmers and others who participated in our household and farm surveys deserve particular thanks. Despite their hard lives, they lent us their time so we could gather the information necessary for our work. They and their counterparts around the world are the motivation behind our work and behind the support of our donors. Their stories are noted or implicit in the research described in this report.

Per Pinstrup-Andersen

FINANCIAL STATEMENTS

Presented here is a summary of financial information for the years ended December 31, 2001 and 2000. The full financial statements and the independent auditors' report are available from IFPRI on request.

Balance Sheets

December 31, 2001 and 2000 (US\$ thousands)

Assets		2001	2000
Current assets	Cash and cash equivalents	\$ 3,694	\$ 6,417
	Investments	1,755	1,860
	CGIAR grants receivable	697	503
	Restricted projects receivable (net)	2,762	2,824
	Other receivables	265	550
	Other current assets	314	313
	Total current assets	9,487	12,467
Other assets	Investments—long term	9,246	5,685
	Property and equipment, net	518	557
	Total assets	\$ 19,251	\$ 18,709
Liabilities and net assets			
Current liabilities	Accounts payable	\$ 728	\$ 1,200
	Accrued vacation	740	660
	Advance payment of CGIAR grant funds	387	—
	Deferred rent (current portion)	32	—
	Unexpended restricted project funds	7,945	7,589
	Other liabilities	18	17
	Total current liabilities	9,850	9,466
Noncurrent liabilities	Deferred rent	949	879
	Accrued post-retirement benefits	597	556
	Total noncurrent liabilities	1,546	1,435
	Total liabilities	11,396	10,901
Net assets—unrestricted	Operating reserves	4,693	4,001
	Reserves allocated for subsequent year expenditure	2,644	3,250
	Net investment in property and equipment	518	557
	Total net assets	7,855	7,808
	Total liabilities and net assets	\$ 19,251	\$ 18,709

Statements of Revenue, Expenses, and Changes in Operating Reserves

For the Years Ended December 31, 2001 and 2000 (US\$ thousands)

Revenue		2001	2000
Grant and contract income			
	Unrestricted	\$ 8,019	\$ 8,566
	Restricted	14,346	13,270
Investment income		737	866
	Total revenue	\$ 23,102	\$ 22,702
Expenses			
Program services	Direct research and outreach	\$ 19,533	\$ 18,233
	Other services	253	191
Management and general		3,269	3,172
	Total expenses	\$ 23,055	\$ 21,596
	Excess of revenue over expenses	\$ 47	\$ 1,106
Transfer (to) from reserves allocated for subsequent year expenditure		684	(566)
Transfer (to) from net investment in property and equipment		(40)	(108)
	Increase in working capital fund	\$ 691	\$ 432
Operating reserves, beginning of year		4,001	3,569
Operating reserves, end of year		\$ 4,692	\$ 4,001

Schedule of Expenses by Type

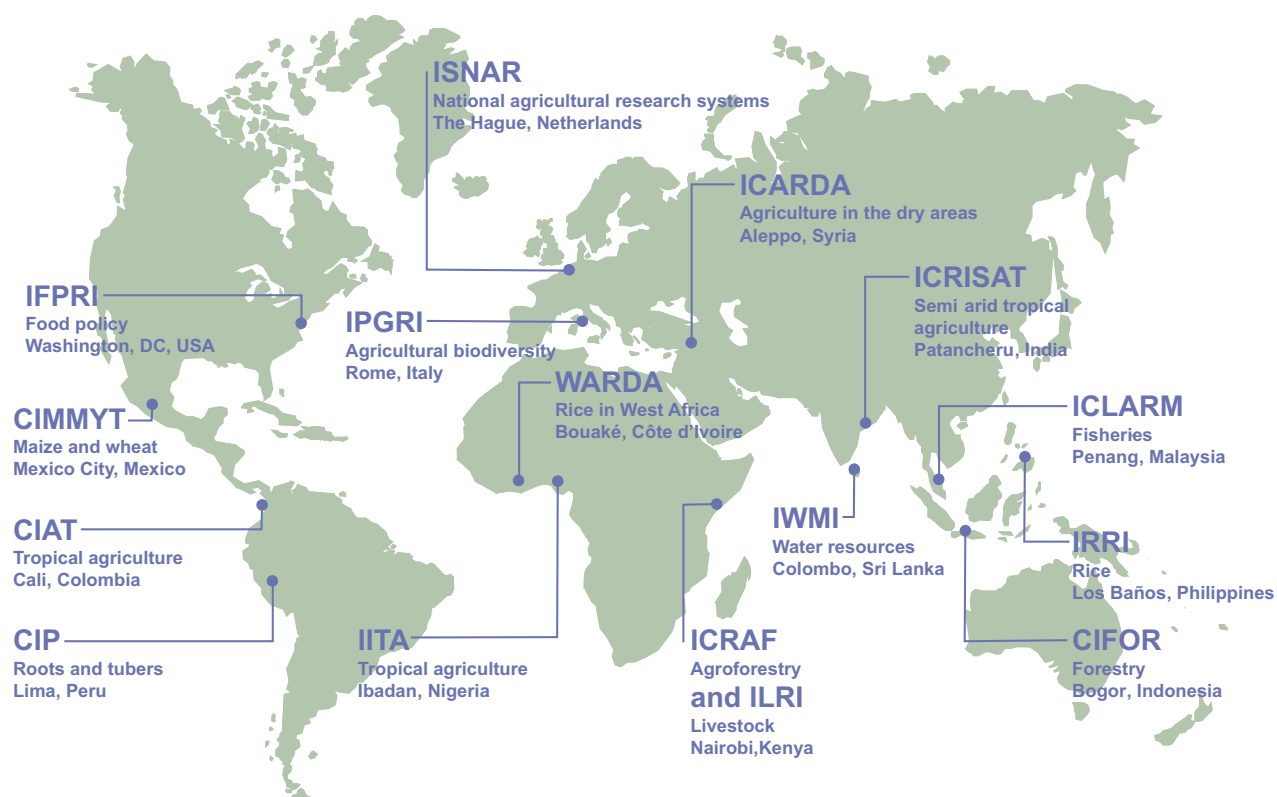
(US\$ thousands)

Expenses	2001	2000
Personnel	\$ 6,789	\$ 6,484
Fringe benefits	3,979	3,746
Collaboration/field expenses	4,504	4,501
Travel	1,603	1,536
Computer	450	439
External publications	495	539
Trustees' expenses (nontravel)	289	127
Office operations	3,859	3,261
Foreign exchange loss (gain)	756	659
Depreciation/amortization	331	304
Total	\$ 23,055	\$ 21,596

FUTUREsm HARVEST

IFPRI is one of 16 food and environmental research organizations known as the Future Harvest Centers. The centers, located around the world, conduct research in partnership with farmers, scientists, and policymakers to help alleviate poverty and increase food security while protecting the natural resource base. The Future Harvest Centers are funded principally through the 58 countries, private foundations, and regional and international organizations that make up the Consultative Group on International Agricultural Research (CGIAR).

In 1998, the centers supported by the CGIAR created Future Harvest as a charitable and educational organization to advance the debate on how to feed the world's growing population without destroying the environment, and to catalyze action for a world with less poverty, a healthier human family, well-nourished children, and a better environment. Future Harvest reaches out to media, academics, scholars, and scientists in the world's premier peace, environment, health, population, and development research organizations, as well as to policymakers and civil society. Future Harvest enlists world-renowned leaders to speak on its behalf to raise awareness and support for research, promotes partnerships, and sponsors on-the-ground projects that bring the results of research efforts to farmers in Africa, Asia, and Latin America. For more information on Future Harvest, go to www.futureharvest.org.



FUTURE HARVEST CENTERS

- CIAT Centro Internacional de Agricultura Tropical www.ciat.cgiar.org
- CIFOR Center for International Forestry Research www.cifor.cgiar.org
- CIMMYT Centro Internacional de Mejoramiento de Maiz y Trigo www.cimmyt.org
- CIP Centro Internacional de la Papa www.cipotato.org
- ICARDA International Center for Agricultural Research in the Dry Areas www.icarda.cgiar.org
- ICLARM The World Fish Center www.iclarm.org
- ICRAF International Centre for Research in Agroforestry www.icraf.cgiar.org
- ICRISAT International Crops Research Institute for the Semi-Arid Tropics www.icrisat.org
- IFPRI International Food Policy Research Institute www.ifpri.org
- IITA International Institute of Tropical Agriculture www.iita.org
- ILRI International Livestock Research Institute www.cgiar.org/ilri
- IPGRI International Plant Genetic Resources Institute www.ipgri.cgiar.org
- IRRI International Rice Research Institute www.irri.org
- ISNAR International Service for National Agricultural Research www.isnar.cgiar.org
- IWMI International Water Management Institute www.cgiar.org/iwmi
- WARDA West Africa Rice Development Association www.warda.cgiar.org

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