IFPRI

1999-2000



INTERNATIONAL FOOD POLICY RESEARCH INSTITUTE

ESSAYS

THE LIFE CYCLE OF MALNUTRITION

ERADICATING MALNUTRITION:
INCOME GROWTH OR NUTRITION PROGRAMS?

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 Harvest centers and receives its principal funding from 58 governments, private foundations, and international and regional organizations known as the Consultative Group on International Agricultural Research.

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MESSAGE FROM THE OUTGOING CHAIRMAN OF THE BOARD OF TRUSTEES

As the year 2000 opened, IFPRI celebrated its 25th anniversary—a happy and important occasion for the organization. At an anniversary dinner in February 2000, we paid tribute to the many people that dedicated their efforts and skills to the creation of what has become a highly successful institution. It was the wisdom and energy of people such as the late Sir John Crawford, David Bell, Lowell Hardin, and others that led the way when the organization was born in 1975. From its beginnings under Dale Hathaway, IFPRI swiftly became a going concern that has continued to grow under the leadership of John Mellor, Just Faaland, and now, Per Pinstrup-Andersen.

Of course, IFPRI is now a very different institution from what it was in 1975. Our growth is, I think, a measure and a recognition of IFPRI's success in doing useful research of good quality. But it also illustrates our great responsibilities, now and in the future, to all those who have shown confidence in our work and to those that hope and struggle for a better life in the rural areas of the world.

We cannot rest on past success. We have the opportunity and the responsibility to do more. The food situation has improved in the past 25 years, but the world faces new and difficult challenges. The poor are still too numerous, and hunger and malnutrition are still serious and widespread. The environment is deteriorating, and we are losing biological diversity. Agriculture bears responsibility for some of these problems yet at the same time offers real potential solutions.

The main problem rural people face is the deterioration of the rural landscape as a locus for the creation of social, cultural, and economic value. When countries perceive industrialization as the basis for economic development and cities as the best place for economic activity, they underestimate the value of natural resources and of rural areas themselves as attractive places for people and jobs. The rural economy is vital for promoting the production of food and other primary goods. In addition, agriculture and other land uses yield a wide range of goods and services besides food that can affect social and cultural systems and contribute to economic growth. The various uses of land in rural areas are interrelated, and their relative importance will depend on strategic choices at the local and national levels. Making sound choices will require high-quality research, and IFPRI is in a good position to play a leading role in the conduct of policy-relevant research.

During the year 2000 my term as a member of the Board of Trustees comes to an end. It has been an honor and a privilege to be a part of this institution. I want to thank IFPRI's staff, the director general Per Pinstrup-Andersen, and my Board colleagues for their confidence and support during these challenging and exciting years.

Martin Piñeiro

MESSAGE FROM THE INCOMING CHAIRMAN OF THE BOARD OF TRUSTEES

At the dawn of the 21st-century, IFPRI faces many exciting challenges. The Institute has established a track record of impressive research and capacity strengthening. It has had a positive impact in helping to create a more food secure world. But much remains to be done before the global vision of a world free from hunger is achieved. Food policy research will continue to have a critical role to play if that vision is to become a reality.

Among the challenges we face are:

- *What policies need to be in place to assure that cutting-edge technological developments—in communications, in molecular biology, in health care—are accessible to poor people in developing countries, with adequate safeguards against any risks?*
- *How can the developing countries best be incorporated into global trade negotiations so that their needs and interests are given due consideration, and the agreements that result foster not only a more liberalized trading environment, but one that is fair and equitable as well?*
- *Can we bring new knowledge to bear so that policymakers will give their highest priority to tackling the scourge of child malnutrition?*
- *Can appropriate policies assure that the emerging "livestock revolution" benefits small-scale producers and poor consumers as well as the more affluent citizens of the developing countries?*
- *What sorts of public investments in agriculture and rural development—roads, research, electricity, irrigation, health, education—will have the biggest impact on poverty and economic growth?*
- *Closely related to this, what policies will help foster economic security in resource-poor areas without degrading natural resources?*
- *What kinds of agricultural diversification and rural development will best help end poverty and promote food security?*

IFPRI's 21st-century research portfolio is addressing all these critical questions and many others.

But we are operating in a world where many serious impediments stand in the way of achieving food security:

- *Agricultural research, once a mostly public sector activity, has increasingly become dominated by the private sector. This is especially true of cutting-edge technologies like genetic engineering. In such an environment, how can we make sure that poor people have access to technologies that could benefit them?*
- *Violent conflict, HIV and AIDS, and climate factors such as El Niño, La Niña, and global warming all pose a serious threat to long-term food security.*

- *Governments in developing countries are not making agriculture, food security, and child nutrition their top priority, and donors of official development assistance are not channeling sufficient resources into these areas.*

- *Projections by IFPRI and others indicate that poverty, hunger, and degradation of natural resources will all worsen in Sub-Saharan Africa.*

- *Rapid urbanization in too many cases means the urbanization of food insecurity.*

- *Although women and children make up the vast majority of food-insecure people, too often the policy response fails to recognize the importance of empowering women for sustainable development.*

- *Even when developing countries undertake policy reforms that will allow them to seek the fruits of economic globalization, the policies of the industrialized countries often create serious impediments.*

Although the 20th-century saw world wars, famines, and abuses of human rights, it was also a time of tremendous progress against poverty, hunger, and disease. School enrollments and literacy rates soared, the percentage of children immunized against killer diseases shot up, and democratic governance became the norm rather than the exception worldwide.

The main issue of the 21st-century will be whether humanity continues that progress toward a world in which everyone enjoys a decent standard of living while protecting the biophysical environment upon which human existence depends. Adequate food for all is obviously an essential piece of such a world. Public policies provide the crucial framework for fostering universal food security, and research that helps shape the appropriate policies is vital. IFPRI's mission remains as compelling today as it was 25 years ago when visionaries like Sir John Crawford and Dale Hathaway launched the Institute.

It is a humbling experience to be elected chairman of the Board of Trustees of such a vital and effective organization. I look forward to working with the Board, the director general, the staff, and the larger CGIAR family to build on our past work and move in important new directions. No organization has more noble goals. Our task is to deliver real outcomes that make a genuine contribution to attaining these goals.

Geoff Miller

DIRECTOR GENERAL'S INTRODUCTION

The drama that played out at the Seattle meeting of the World Trade Organization in late 1999 drew the public's attention, perhaps more than ever before, to how trade, biotechnology, and other global forces have become vital and controversial issues in the dialog between industrialized and developing countries. While this attention led to rancorous debate and even violence in Seattle, we at IFPRI applaud honest and open discussion about how these issues affect the lives and needs of the world's poorest people. That most certainly includes closer examination of global institutions and mechanisms that make a difference in their lives.

At IFPRI we share the Seattle protesters' passionate concern for the poor people of developing countries, but we have a different way of attacking the problem. The policies pursued by developing countries can, we believe, either take advantage of the new global realities for the benefit of their own people, including the poor, or cause them to lose out on whatever economic opportunities exist. Through research, we seek to learn how policymakers can help improve the lives of their people, and then we make these findings available both to those in a position to bring about positive change and to the global community.

Naturally, in 1999 globalization and trade, and their effects on the food security of poor people in developing countries, remained high on our research agenda. Work done at IFPRI shows that world food trade will become more and more important in the coming decades and that it is in the interest of developing countries to be active and informed participants in trade negotiations. To gain the most from the world trading system, developing countries must have fair access to markets and must make the domestic policy changes that will allow them to participate efficiently and fairly in global trade.

Agricultural biotechnology has also galvanized public opinion in the past year. IFPRI is stepping up its research on this controversial topic and is committed to studying how the new technologies will affect the interests of poor farmers and consumers in developing countries and what policies can increase the benefits and help manage the risks.

Biotechnology is just one of the tools being brought to bear on the urgent problem of malnutrition, the subject of two essays in this report. Those who know IFPRI's work are well aware that our projections show malnutrition continuing to be an enormous problem in the next two decades: 135 million children under five years of age will be malnourished in 2020, one out of every four children in developing countries. Stuart Gillespie and Rafael Flores describe the price that malnutrition exacts at each stage in the life cycle and show how it passes down through the generations, creating a vicious circle of poor nutrition, poor health, and low productivity.

In the second essay, Lawrence Haddad and Harold Alderman examine whether this cycle of malnutrition can best be broken by raising people's incomes so they can afford to improve their nutrition themselves or by intervening directly to give them better food, health care, and living environments. The perspectives presented in these two essays, drawing on IFPRI's work in these areas, offer a thought-provoking and multifaceted view of this complex problem.

As the CGIAR's lead center on nutrition, IFPRI also organized a conference involving nine other CGIAR centers and many other organizations to consider agricultural solutions to malnutrition in 1999. At the conference agricultural scientists, nutritionists, and economists explored whether the CGIAR should give human nutrition higher priority on its agenda and discussed food-based approaches for reducing malnutrition. Outside nutritionists knew little about the work of the CGIAR centers in this area and vice versa. The conference provided a unique opportunity to link these two communities and to make the links between agricultural research and improved nutrition clearer.

As the year 1999 ended and 2000 began, IFPRI turned 25 years old. This anniversary gave us the chance to look back on the institute's accomplishments and to look forward to the work that lies ahead. The global food situation has improved greatly over the past few decades. Global food production has increased faster than population growth, and many millions of people have moved out of poverty and malnutrition. But poverty, food insecurity, malnutrition, and natural resource degradation remain critical problems. Eradicating these devastating problems will require well-thought-out and imaginative policies, and to design and implement them in a rational fashion, policymakers will need sound information. We are aware of the importance of communication. The best research will be fruitful to the poor people in developing countries only if we reach the policymakers and those who have an influence on them. IFPRI's research will have impact only if it is communicated to the right people, at the right time, in the right way. I therefore encourage readers of this report to give me their feedback on how and where we can improve.

Per Pinstrup-Andersen

THE LIFE CYCLE

Malnutrition is not a disease that runs its course, bringing immunity. Rather it is a process, with consequences that may extend not only into later life, but also into future generations. The process of becoming malnourished often starts in utero and may last, particularly for girls and women, throughout the life cycle. It also spans generations. A stunted girl (that is, one whose height is significantly low for her age) is likely to become a stunted adolescent and later a stunted woman. Besides posing threats to her own health and productivity, poor nutrition that contributes to stunting and underweight in her adult life increases the chance that her children will be born malnourished. And so the cycle turns.

OF MALNUTRITION

Stuart Gillespie and Rafael Flores

BIRTH AND INFANCY

This year some 30 million babies in the developing world—around 82,000 every day—will be born with impaired growth due to poor nutrition during fetal life. Two-thirds of these infants will be born in South and Central Asia. By any standard, this is a major global human development problem with profound short- and long-term consequences for individuals, households, communities, and nations.

In developing countries the main direct causes of intrauterine growth retardation (IUGR) are nutritional. IUGR occurs when women suffer from low weight and short stature before pregnancy—largely because of their own childhood malnutrition—and then gain too little weight during pregnancy, primarily because they do not consume enough food or because infection compromises the absorption or utilization of the food they do eat. Other factors underlie these direct causes, including household food insecurity, poor caring practices, and inadequate health and environmental conditions.

The consequences of being born malnourished are grave. IUGR infants suffer from impairment of most immune functions and face an increased risk of diarrhea and pneumonia. The risk of neonatal death is 10 times higher for infants weighing 2–2.5 kilograms than it is for those weighing 3–3.5 kilograms. IUGR also significantly reduces body size, changes body composition, and lowers muscle strength in the long term. Recent research has linked IUGR to neurological dysfunction, associated with attention deficits, hyperactivity, clumsiness, and poor school performance.

Beyond childhood, there is growing evidence that IUGR increases the risk of acquiring high blood pressure, non-insulin-dependent diabetes, coronary heart disease, and cancer in adult life. The "fetal origins of disease" hypothesis posits that poor nutrition during critical periods of gestation and early infancy, followed by relative affluence, increases the risks of chronic diseases in adulthood. Urbanization and rapid economic development are changing people's dietary patterns and lifestyles in ways that make such consequences more likely to emerge.

Pregnant women and their fetuses not only need to consume adequate amounts of food but also need to get access to adequate micronutrients—the vitamins and minerals that help the body function. Apart from the direct effects on the woman herself, micronutrient malnutrition during pregnancy has serious implications for the developing fetus. Iodine deficiency can cause fetal brain damage or stillbirth, folate deficiency may result in neural tube defects, and iron deficiency anemia and vitamin A deficiency can raise the future infant's risk of illness and death and impair vision and cognitive development.

CHILDHOOD

IUGR infants are more likely to become stunted children. In addition, conditions during infancy and early childhood, like frequent or prolonged infections and inadequate consumption of nutrients—particularly energy, protein, vitamin A, zinc, and iron—can contribute to underweight and stunting among preschool children. Inadequate food, health, and care in the household or community again underlie these immediate causes.

The recently released *Fourth Report on the World Nutrition Situation* prepared by the United Nations Sub-Committee on Nutrition and IFPRI states that currently about one in three children under five years old in the developing world is stunted, with Eastern Africa (48 percent) and South Central Asia (44 percent) having the highest levels. This translates into some 182 million stunted children, 70 percent of whom live in Asia and 26 percent in Africa.

Almost 27 percent of all under-five children are currently underweight (of low weight for their age), a prevalence that dropped during the 1990s but not very rapidly. Most countries failed to achieve the ambitious goal set at the 1990 World Summit for Children of halving childhood underweight prevalence by the year 2000.

Childhood malnutrition has immediate consequences. Underweight children tend to have more severe episodes of diarrhea and a higher risk of pneumonia. They are also more likely to die. Over 50 percent of the nearly 12 million child deaths that occurred in 1995 were associated with low weight for age, the majority of which derived from the effects of mild to moderate undernutrition.

Can these children catch up? Can malnutrition be reversed if children are adequately nourished later? The answer is yes, to a point. The potential for catch-up growth among stunted children is limited after age two years, particularly when such children remain in poor environments. A recent study in the Philippines, however, has shown that some catch-up between the ages of two and eight and a half years is feasible for children who were not born with low birthweight or severely stunted in infancy. Children who were stunted at age two years, however, whether or not they later achieved catch-up growth, were found to suffer significantly from later deficits in cognitive ability, a finding that further emphasizes the need to prevent early stunting.

Data on the nutritional status of school-age children are increasingly being collected, as evidence mounts linking malnutrition or hunger with poor school attendance, performance, and learning.

ADOLESCENCE

Adolescence, which covers most of the second decade of life, is a transition phase when children become adults. During this time, growth in stature or height accelerates, driven by hormonal changes, and is faster than at any other time in the individual's postnatal life except the first year.

Research has shown that better-nourished girls grow faster before menarche and reach menarche earlier than undernourished girls, who grow more slowly but for longer, as menarche is delayed. Ultimately, these two factors tend to balance out, and well-nourished and undernourished adolescents may achieve similar total height during adolescence. The adult height finally attained, however, may still differ as a result of pre-existing childhood stunting. Studies of several countries have shown little change in average height-for-age during the adolescent years, indicating little catch-up.

Because underweight adolescent girls are growing for longer, they may not finish growing before their first pregnancy. A still-growing adolescent is likely to give birth to a smaller baby than a mature woman of the same nutritional status, probably because of poor placental function in the adolescent and because the growing adolescent and the growing fetus are competing for nutrients. Calcium status is a particular concern, as the bones of adolescents still require calcium for growth at a time when fetal needs for bone growth are also high.

There remains little evidence to suggest that individuals who suffer from growth retardation in early childhood can significantly compensate for it in adolescence. Stunted children are thus likely to become stunted adults. Moreover, even if an intervention could lead to adolescent catch-up growth, which could reduce obstetric risk due to small maternal size, it would not necessarily reverse the effects of early childhood stunting on cognitive function.

ADULTHOOD

The economic livelihood of populations depends on the health and nutritional well-being of adults. In adults the main cause of a reduction in body weight is a decrease in food intake, often in combination with disease, but when energy intake exceeds energy expenditure, the excess is stored in fat mass. Both conditions, underweight and overweight, constitute adult malnutrition, and both represent common problems in the developing world. For example, in Bangladesh more than 50 percent of women are underweight, with just 4 percent overweight. In Egypt the opposite is true: over 50 percent are overweight and less than 2 percent are underweight.

Both underweight and overweight conditions have serious health effects. Underweight adults allocate fewer days to heavy labor and are more likely to fail to appear for work owing to illness or exhaustion.

At the other end of the spectrum, overweight conditions are associated with an increased prevalence of cardiovascular risk factors such as hypertension, unfavorable blood lipid concentrations, and diabetes mellitus. Overweight is also a major risk factor for the development of gallstones and endometrial cancer and is related to osteoarthritis in several joints. As already mentioned, adults who were malnourished as infants have a heightened risk of developing some of these conditions.

OLD AGE

Populations are aging. By 2025, the earth will house 1.2 billion elderly adults, of whom nearly 70 percent will live in developing countries. For most of these older people, retirement is not an option. Poverty, a lack of pensions, the deaths of younger adults from AIDS, and the migration of younger people from rural to urban areas are among the factors that will compel older people to continue working. Adequate nutrition, healthy aging, and the ability to function independently will be essential components of a good quality of life. Recent multicountry studies have shown significant malnutrition among older adults. In India, for example, two out of three over-70-year-olds are underweight. Research shows that the nutritional status of older adults is strongly related to functional ability, psychomotor speed and coordination, mobility, and the ability to carry out activities of daily living independently, even after controlling for age, sex, and disease.

WHAT CAN BE DONE?

The picture need not be so gray. Vicious circles—such as the life cycle of malnutrition—based as they are on mutually reinforcing processes, can be transformed into virtuous circles by more consistently and effectively applying our growing knowledge of what works, and where, in combating malnutrition.

The life cycle offers clear windows for preventive action. One such window comes in the first two years of life. Improving the environment in which the young child grows during this time could prevent and even reverse stunting and its consequences. Improvements in breastfeeding and complementary feeding practices increase both the survival prospects and the health and nutritional status of infants in the short and long term. A well-known study in Central America has shown that nutrition interventions in pregnancy and early childhood lead to improved body size and composition and better physical and intellectual performance in the adolescent and young adult.

Community-based nutrition programs—which may include activities such as communications for behavioral change, breastfeeding and complementary feeding promotion and support, micronutrient supplementation, and targeted supplementary feeding—are becoming more effective all the time, because we now know more about key factors in their success. Past experiences in Bangladesh, India, Indonesia, Tanzania, Thailand, and Zimbabwe have generated important lessons that are now being applied globally in a new generation of programs. We know that for programs to emerge, grow, and sustain themselves, the conditions in the community must be appropriate and communities must actively take part, not just as implementors but as decisionmakers. And we know more about the kinds of skills and resources that need to be strengthened in various groups in society to support such programs.

But more needs to be done. To improve decisions on policies and programs, we need more and better-quality data on nutritional status throughout the life cycle. Program experiences also need to be better documented and disseminated more effectively, so that others can benefit.

The potential gains are massive. Investing in maternal and childhood nutrition will have both short- and long-term benefits of huge economic and social significance, including reduced health care costs throughout the life cycle, increased educability and intellectual capacity, and increased adult productivity. No economic analysis can fully capture the benefits of such sustained mental, physical, and social development.

While preventing fetal and early childhood malnutrition deserves particular attention, the life cycle dynamics of cause and consequence demand a holistic, inclusive approach to malnutrition. Adequate nutrition is a human right for all people, and intervening at each point in the life cycle will accelerate and consolidate positive change.

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Great strides have been made in reducing malnutrition over the past few decades. In 1980 almost half the children under five in developing countries suffered from stunting (abnormally low height for one's age)—one of the main indicators of poor nutrition. By 2000 one-third did, a substantial reduction by any measure. Nevertheless, 182 million children below five remain stunted—a totally unacceptable situation. To make matters worse,

ERADICATING

progress in reducing stunting has slowed in the past two decades, and the number of stunted children in Africa has grown. In Eastern Africa the percentage of children who are stunted is rising. If current trends continue, the goal of halving the number of undernourished people by the year 2015, set at the World Food Summit in 1996, cannot be met.

How can malnutrition be reduced fast enough to meet humanitarian goals such as the one set at the World Food Summit? Some people argue that the way to meet nutrition targets is to stimulate greater economic growth and higher incomes for poor people. Because malnutrition and poverty often go hand in hand, it is argued, rates of malnutrition provide neither an independent perspective on poverty nor a basis for reducing malnutrition that is distinct from one for reducing poverty.

Others, however, argue that income growth is a blunt instrument for reducing malnutrition and that more resources must be allocated to direct nutrition programs such as micronutrient supplementation, food fortification, and community-based initiatives that change dietary and care behaviors.

What do the data say about how far income growth can take us?

MALNUTRITION

INCOME GROWTH OR NUTRITION PROGRAMS?

Lawrence Haddad and Harold Alderman

POVERTY AND MALNUTRITION ARE LINKED BUT ARE NOT IDENTICAL

Poverty and malnutrition often afflict the same beleaguered groups of people. In fact, rates of malnutrition are sometimes used as indicators of poverty. In general, more income leads to better nutrition over time. Increased income usually enables poor families to get better access to the things that matter for good nutrition: food of sufficient quantity and quality, enough time for mothers to get and use good information on child feeding and hygiene, adequate supplies of clean water, and sufficient preventive and curative health care of good quality.

But, though the relationship between poverty and malnutrition is potentially strong, if families do not spend their increased income on the factors that determine good nutrition—better food, care, and health—then malnutrition is unlikely to decrease. For example, if extra income does nothing to empower women, then nutrition levels may not improve. When women have control over increased income, children's nutritional status tends to improve more quickly. Increased income may also fail to enhance nutritional status if women (and men) have to work longer and harder to get that income, thus providing less care to children. And more income may not lead to better food, care, and health if roads, markets, water supply, and health clinics are unavailable. The potential disconnect between poverty and nutrition means that poor people are not always malnourished, and malnourished people are not always poor. Figure 1 shows that in three of five countries studied, more than 40 percent of nonpoor households with preschoolers contain at least one who is stunted.

Figure 2 reveals that there is a strong and regular relationship of malnutrition to gross domestic product (GDP). Nevertheless malnutrition rates vary widely even among the poorest countries. In the 1990s the share of underweight preschool children in countries that had a GDP per capita below US$1,000 ranged from 20 to 62 percent. So, is it possible for income growth to lead to a substantial reduction in malnutrition within a generation?

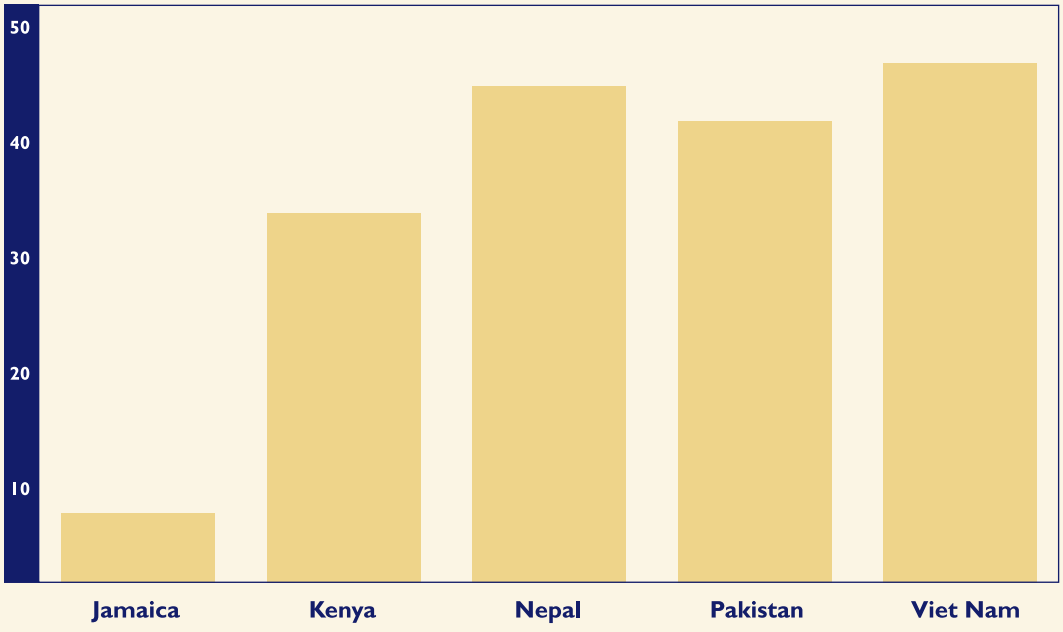


Recent research from IFPRI and its partners shows the potential for income growth to improve nutritional status. Encouragingly, income growth indeed contributes to improved nutritional status in 12 countries studied. Figure 3 charts how children's nutritional status would improve in these countries if per capita income grew by 5 percent a year. This pattern is consistent with analysis of cross-country data. Nevertheless, it would take many years of high growth—5 percent is ambitious by historical standards—to reduce the prevalence of underweight children even by 50 percent and then only in Morocco. Income growth alone will not result in the halving of preschool malnutrition in the developing world by 2020—a goal less ambitious than the World Food Summit target.

NUTRITION PROGRAMS CAN REDUCE MALNUTRITION FASTER

Given the situation described, direct interventions are needed to reduce malnutrition in the short to medium term. Nutrition programs such as vitamin A, iron, and multiple micronutrient supplementation; community-based care promotion to improve infant feeding and hygiene; food-based interventions that promote dietary diversity; fortification of foodstuffs consumed by malnourished people, either through industrial processes or through traditional plant breeding; and food supplementation for undernourished young women are all more important than ever. These programs need to be better funded and staffed, and better managed as they scale up, in order to halve malnutrition within the next generation.

Figure 1. Malnutrition in nonpoor households



Source: S. Appleton and L. Song, Income and human development at the household level: Evidence from 6 countries, background paper for *World Development Report 2000/01* (Economics Department, University of Bath, U.K., 1999).

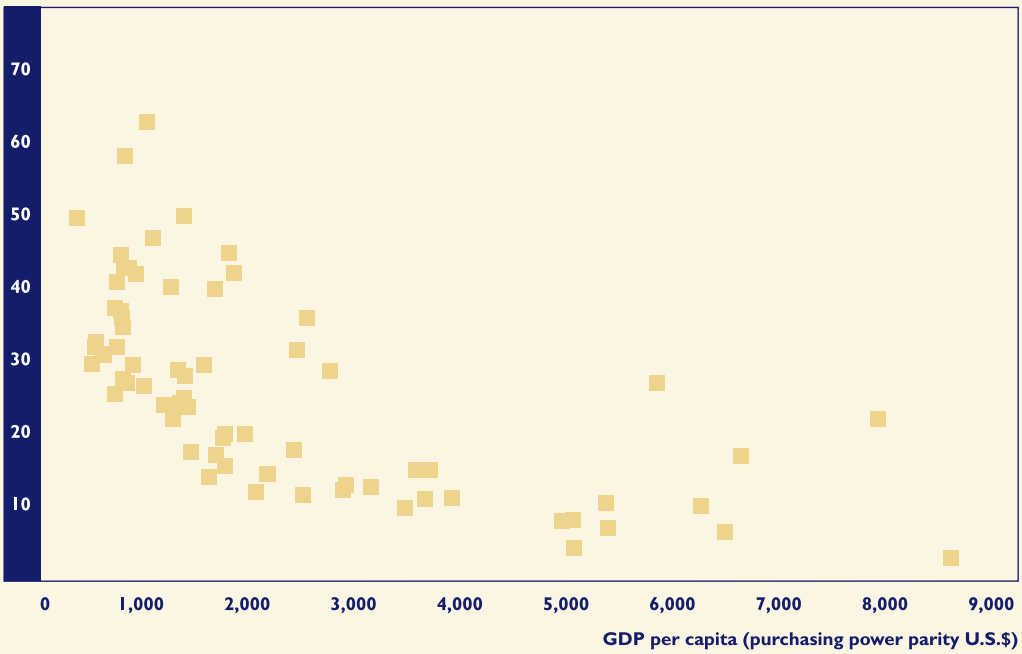
By substantially cutting malnutrition in the next generation, these direct interventions will also sow the seeds for better nutrition in the generation after that. As Stuart Gillespie and Rafael Flores explain in the accompanying essay, nutritional status spans generations—a girl with good nutrition will grow into a healthier, stronger woman, and a woman with good nutrition will give her children a healthier start in life.

BETTER NUTRITION WILL RAISE INCOME

Investments in direct nutrition interventions should also be viewed as investments to fight poverty in the medium term, because reductions in malnutrition will lead to increases in income later on in life. The primary route is thought to be via education. Improved nutrition leads to better developmental levels in infancy, earlier age of school enrollment, better enrollment rates, and better cognitive function. For example, a 10 percent increase in the stunting of the average Ghanaian child causes a 3.5 percent increase in age of first school enrollment. In Pakistan a relatively small improvement in height-for-age for preschoolers leads, on average, to an increase in subsequent school enrollment rates of 2 percent for boys and 10 percent for girls, increasing to 5 and 16 percent, respectively, when diarrhea rates are reduced by half as well. Better nutrition leads to improved education, which in turn, helps people escape poverty over time, as a recent study of several countries has shown.

Proper nutrition not only boosts household income but income growth at the national level as well. A study by Susan Horton derives conservative estimates of the forgone GDP as a result of just iron deficiency in children and iron, iodine, and protein energy deficiency in adults. For Pakistan the annual losses exceed 4 percent of annual GDP. For Bangladesh the cost of iron deficiency in children alone is nearly 2 percent of GDP.

Figure 2. Malnutrition and GDP per capita in developing countries in the 1990s



Source: H. Alderman, S. Appleton, L. Haddad, L. Song, and Y. Yohannes, Links between income growth and reductions in malnutrition (World Bank and IFPRI, Washington, D.C., 2000, draft).



REVERSING A VICIOUS CIRCLE

In the medium to long run, income increases are crucial for reducing malnutrition. But even optimistic increases in income growth will get many countries less than halfway toward the goal of halving malnutrition within the next generation. Moreover, currently income is not growing in several countries. In the shorter run, therefore, direct nutrition interventions are needed. If carried out effectively on a large scale, such interventions will reduce stunting and thereby preserve children's ability to learn in school, be more productive as adults, and be less susceptible later in life to chronic diseases such as cancer and coronary heart disease.

Income affects nutrition, and nutrition in turn affects income. This can be a vicious circle or a virtuous one. Poverty reduction and effective direct nutrition interventions are needed to move us from the vicious to the virtuous.

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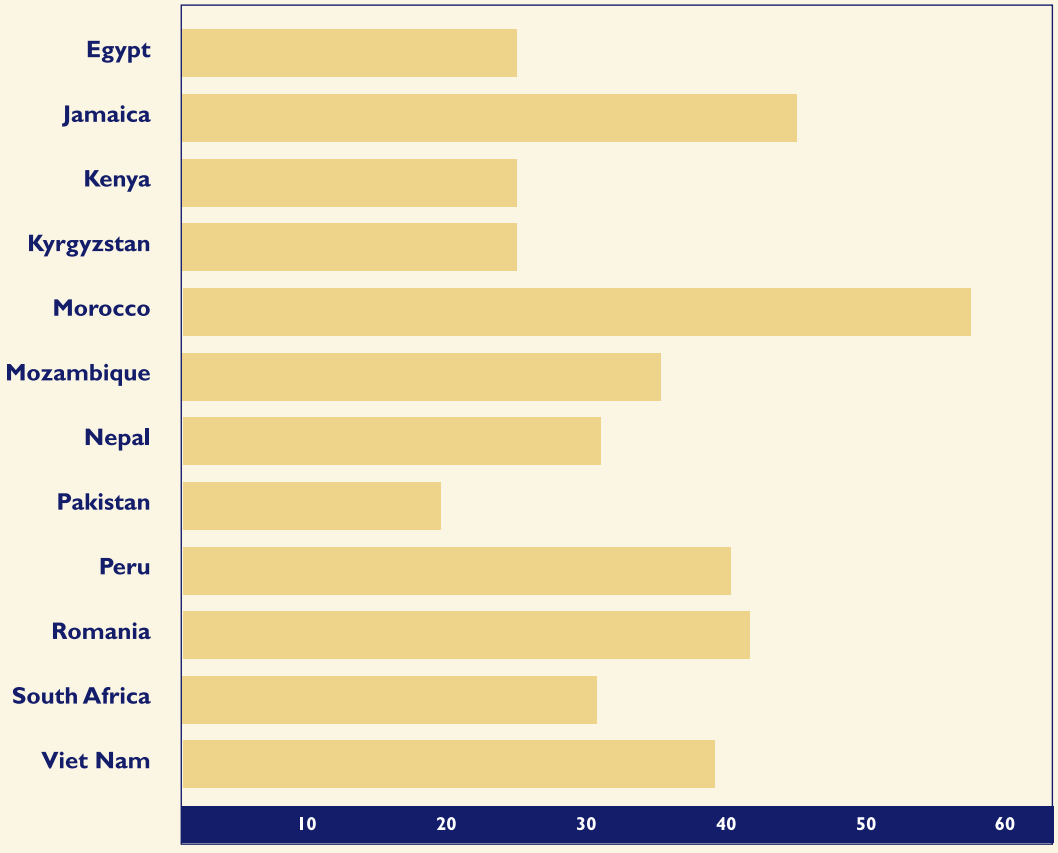
Figure 3. Malnutrition and income growth



Reduction in the prevalence of low weight for age in preschoolers due to a 5% per capita income growth rate to 2020

Source: H. Alderman, S. Appleton, L. Haddad, L. Song, and Y. Yohannes, Links between income growth and reductions in malnutrition (World Bank and IFPRI, Washington, D.C., 2000, draft).

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RESEARCH

No silver bullet has been found that will sustainably end the scourges of hunger and poverty in developing countries. To combat these problems, policymakers must tread a fine line, balancing the needs of urban consumers with those of rural farmers, the realities of the domestic economy with the demands of the global marketplace, and the need for safety nets for the worst-off with the need to promote productivity and self-reliance among their people. Accordingly, research at IFPRI is broad in scope. IFPRI attacks its research problems through four research and outreach divisions, which work both individually and together to find solutions to urgent policy problems, and through a Communications Division, which conveys the results of policy research to those who need it most.

& OUTREACH

ENVIRONMENT AND PRODUCTION TECHNOLOGY

A healthy natural resource base is the backbone of sustainable agriculture. Moreover, while the world's supply of arable land is at its limit, the supply of hungry mouths grows larger every day. IFPRI's Environment and Production Technology Division studies the policies, institutions, and technologies that are most likely to help farmers sustainably produce more food on the same amount of land.

SUSTAINABLE DEVELOPMENT OF LESS-FAVORED LANDS

How, and how much, should countries invest in areas with high levels of poverty and environmental degradation?

About 500 million people now live on lands with less fertile soils and low and erratic rainfall, and the number is growing. Although countries have typically invested most of their spending on agriculture and agricultural research in "high-potential" irrigated and rainfed lands, it is becoming clear that, with continuing population growth, they can no longer afford to ignore the poverty and environmental degradation that exist in less-favored lands. IFPRI researchers are studying the trade-offs of investing in high-potential versus low-potential areas, strategies for sustainably increasing agricultural productivity in less-favored lands, indicators for monitoring resource degradation, and the effects of broad policy reforms on the poor in less-favored areas.

One area that fits this profile is Ethiopia's Tigray region, where soils are poor, rainfall is low and uncertain, poverty is high, and the environment is being badly degraded. IFPRI is undertaking a comprehensive study of development options for different types of communities in this region. One study completed in 1999 focused on the management of community woodlots, which are particularly valuable in this wood-scarce region. The study showed

that collective action to manage woodlots generally works well despite current policy restrictions on cutting trees. However, collective action tends to work better when individual villages rather than groups of villages manage woodlots, when population density is intermediate rather than high or low, and when market access is poor. Conversely, private woodlots are likely to function more effectively in densely populated communities with comparatively good access to markets.

A second study assessed the ecological and economic arguments for and against planting eucalyptus trees in woodlots and on private lands. The study found that using wastelands for private tree planting could generate large economic benefits, while possible adverse ecological impacts could be limited by appropriate site selection. Research to identify other sustainable and poverty-reducing development pathways and policy strategies to achieve such pathways is ongoing in Ethiopia and Uganda.

IFPRI is also working to find ways of monitoring natural resources that are relevant for policy. Because of international agreements and domestic pressures, developing countries have a growing need to monitor a broad range of environmental conditions. But monitoring systems for natural resources are typically a low priority for government investment and fail to lead to solutions to the problems they identify. In 1999 IFPRI began a case study of the Arenal-Tempisque watershed in Costa Rica. The water in this watershed is used to support dairy and cattle production, coffee plantations, an electrical plant, fish farms, and rice and sugar farms. In pursuing its own interests, each user group causes problems for those farther downstream. For example, the farming practices of many dairy and cattle farmers in the upper watershed cause soil erosion, which is contributing to the silting of the reservoir that feeds the hydroelectric power generators. And rice and sugar farmers use large amounts of fertilizers and pesticides that contaminate the water that flows through their irrigation system. Unfortunately, this contaminated water passes through the Palo Verde wetlands (a much-valued conservation area) before draining into the Gulf of Nicoya, where it also affects coastal resources and fishermen's livelihoods. Researchers are looking at options for monitoring and managing the watershed in an environmentally sustainable way that would serve all of the users. The monitoring system must not only track changes in key environmental variables, but also provide insights into the causes of any observed changes and provide an institutional framework through which the key stakeholders can develop local solutions to new or emerging problems. And all this must be done at low cost.

Team Leader: John Pender

WATER RESOURCES

What are the best ways of allocating scarce water to the many users that need it?

Clean freshwater is essential to sustain life, enable development, and support a healthy environment. Because of population and economic growth, households, industry, and agriculture are increasing their water demands, while watersheds and irrigated land are deteriorating and ground and surface water pollution is increasing. IFPRI research aims to understand how different ways of allocating water affect economic productivity, poverty, and the environment and to suggest fair and efficient mechanisms for allocating and using water.

A study of irrigation in Latin America in 1999 showed that developing new sources of water is no longer the best way to cope with the

challenge of water scarcity. Instead, policymakers should work toward making irrigation and water supply systems more efficient, equitable, and environmentally benign. Transferring water management responsibilities from agencies to farmers and privatizing urban water supply and sanitation are important ways of doing this. A model of the Maipo River Basin in Chile shows that a system of trading water rights can direct water to higher-valued uses and, by encouraging farmers to use irrigation to produce high-value crops for both domestic and overseas markets, it need not reduce agricultural income significantly. Moreover, farmers can increase their income by selling their unused water rights to industries and cities during periods of little or no water demand.

Research on the value of water looked at how water can be used to provide sustainable livelihoods for the largest number of people. The study developed ways of assessing the full value of water, including fishing, livestock, domestic, environmental, and other uses and suggested ways of making water use more productive and more equitable.
Team Leader: Mark Rosegrant

PROPERTY RIGHTS AND COLLECTIVE ACTION

How can property rights and collective action help farmers adopt sustainable practices for managing natural resources?

In many cases farmers fail to adopt sound technologies and environmental practices because they do not have secure rights to their land and thus cannot be assured of reaping the benefits of long-term investments or because these practices are only effective if adopted by a group of farmers. IFPRI seeks to discover the most effective ways of providing secure property rights to farmers and under what conditions communities can successfully organize and sustain collective action for natural resource management, including the management of common property resources.

In 1999 IFPRI researchers and their collaborators began to work with benchmark communities in eight countries in West Asia and North Africa to identify community problems and develop plans to solve them. Work also continued on property rights and livestock development in Sub-Saharan Africa. Focusing on semi-arid regions of Africa where competition exists between mobile livestock herders and farmers who produce both crops and livestock, IFPRI and its collaborators are studying how property rights and risk affect livestock development. Researchers have conducted preliminary analyses of data collected in Ethiopia and Niger.

IFPRI is the convening center for the CGIAR's Systemwide Program on Collective Action and Property Rights (CAPRi). Through collaboration among CGIAR and national research centers, nongovernmental organizations, and universities, CAPRi aims to increase knowledge about institutions of collective action and property rights and identify concrete policy solutions. In 1999 CAPRi held a workshop to bring together findings from research at IFPRI and other Future Harvest centers on devolving property rights and fostering local collective action to manage water, forests, aquatic resources, and rangelands.
Team Leader: Peter Hazell
CAPRi Team Leader: Ruth Meinzen-Dick

Strategies for Rural Asia

In 1999 IFPRI *researchers Peter Hazell and Mark Rosegrant prepared two reports for the Asian Development Bank (ADB) to be used in that organization's strategy for rural Asia. The first, one of five background studies, will be released as a book called Transforming the Rural Asian Economy: The Unfinished Revolution and published by Oxford University Press. The second report, titled "Rural Asia: Beyond the Green Revolution," and published by ADB synthesizes the entire ADB study of rural Asia. It points out that developing Asia as a whole has taken remarkable strides since the food crises of the 1960s, but rural Asians must still tolerate lower levels of health, education, and general well-being than their urban counterparts. About 2 billion people live in rural Asia, and another 300 million are expected to join their ranks by 2020. The vast majority of these rural inhabitants still rely, directly or indirectly, on agriculture, forestry, or fishing for their livelihoods, a dependence that places enormous pressure on natural resources.*

(continued)

AGRICULTURAL SCIENCE AND TECHNOLOGY POLICY

How can agricultural research and development be deployed to feed a growing world population and protect the natural resource base?

Over the past half century, technological advances created through research and development (R&D) have supplied a growing world population with more and better food, feed, and fiber. At the opening of the 21st century, however, policymakers face new questions about science policy. How should increasingly scarce public funds for agricultural R&D be prioritized and evaluated? What are the benefits from publicly funded R&D, who receives them, and who should pay for them? What are the appropriate roles of the public and private sectors in conducting R&D, especially biotechnology research? To answer these questions, IFPRI researchers study investment and institutional policies for agricultural science and technology, policies on intellectual property rights over genetic resources and biotechnologies, and the effects of agricultural R&D on productivity, the environment, economic growth, and poverty.

In 1999 the IFPRI team conducted a study on the cost of storing agricultural germplasm in a genebank, in this case that of the International Maize and Wheat Improvement Center (CIMMYT). They found that preserving CIMMYT's existing collection of maize and wheat in perpetuity would involve a one-time annuity investment of about $8 million—probably a bargain when compared with the benefits generated by the collections.

The size of benefits to agricultural research was another topic under study in 1999. IFPRI researchers completed a novel meta-analysis of the rates of return to agricultural research and development (R&D) reported in nearly 300 studies—a comprehensive compilation of the literature published on this topic since the 1950s. They found that overall rates of return averaged 65 percent, but the range of returns around this average was exceptionally large. Reported rates of return depended on a number of factors, including the type of research undertaken, the country doing the research, the methods used to assess the impact, and the characteristics of the evaluator (for example, self or other, type of institutional base, developed or developing country).

Other work completed in 1999 concerned the policies and practices of financing agricultural R&D. An IFPRI/Johns Hopkins University Press book titled *Paying for Agricultural Productivity*, edited by Julian M. Alston, Philip G. Pardey, and Vincent H. Smith, compared agricultural R&D policies and institutions in five countries—Australia, the Netherlands, New Zealand, the United Kingdom, and the United States—finding that these countries face common pressures to privatize agricultural research, to make spending on research more competitive and accountable, and to enter new areas of study, such as food processing, food safety, and environmental concerns.

Team Leader: Philip Pardey

To complete the economic transformation in rural Asia requires growth, but growth that is more equitable and environmentally sustainable than it has been in the past. Meeting these challenges will require that countries apply the lessons already learned about agricultural growth, public sector investment, rural poverty reduction, and natural resource protection more efficiently than ever.

IFPRI's projections show that if governments invest in agriculture and reform their economies, the number of malnourished children will drop sharply to 76 million in 2020. But it does not take much backsliding by governments to lead to unacceptable outcomes within a decade. If governments become even more complacent than they are today about agriculture, invest less in rural areas, and fail to make needed policy reforms, the number of malnourished children will remain virtually unchanged in 2010 from the 1993 level of 140 million.

PUBLIC INVESTMENT IN RURAL AREAS

How should governments spend their increasingly scarce resources to help reduce poverty and raise agricultural production in rural areas?

Government spending on agriculture and rural areas is a major determinant of agricultural growth and rural poverty reduction in most developing countries, but policy reforms are leading many countries to reduce spending on rural areas. These spending cuts will not only lower future productivity growth and food supplies, but also slow and even reverse recent trends in rural poverty decline. Reversing these financial trends will be difficult, so countries will have to concentrate on using public funds more efficiently. IFPRI seeks to review changes in public investment in rural areas, to analyze the impact of different kinds of investments, and to offer policy guidelines on future priorities for these investments.

In 1999 IFPRI researchers found that government spending in China on agricultural research and extension, irrigation, rural education, and infrastructure have all helped increase agricultural production and reduce poverty in recent decades, but not to the same degree. Government investments in education did the most to reduce poverty and boosted production growth significantly. Government spending on agricultural research and extension did the most to raise agricultural production growth and also had large trickle down benefits for the rural poor. Spending on rural infrastructure—communication, electricity, and roads—reduced poverty somewhat, but investments in irrigation had only small effects on agricultural production growth and poverty reduction.

In a similar study of India, IFPRI researchers found that government spending on roads had the largest impact on poverty reduction as well as a large effect on agricultural growth. Government spending on agricultural research and extension had the largest impact on agricultural productivity growth and also had large benefits for the rural poor. Government spending on rural and community development helped reduce poverty but not as much as spending on roads, agricultural research and extension, and education. Both country studies also revealed that the returns to additional public investments are now higher in some poorer rainfed areas than in irrigated and high-potential rainfed areas.

Team Leader: Shenggen Fan

FOOD CONSUMPTION AND NUTRITION

To lead healthy and productive lives, people must not only have access to food but also be able to use the food they eat for good nutrition. The Food Consumption and Nutrition Division studies the behavior of individuals, households, institutions, and communities to help policymakers create policies and programs to promote food security and reduce poverty.

RURAL FINANCE

What kinds of programs give the rural poor access to credit and saving services and contribute to their well-being?

When poor people have access to credit, saving, and insurance services, they are able to increase their incomes, preserve their assets during times of hardship, and buy food during lean periods. IFPRI researchers study innovative rural financial systems and how these systems affect rural people's income, agricultural production, consumption, and nutrition.

In 1999 the IFPRI research team completed studies in Bangladesh, Egypt, and Malawi. They found that offering credit to rural people had few long-term benefits for those people if they did not also have access to agricultural land, irrigation, and well-functioning markets for both buying and selling. Poor people value saving services very highly, according to the research, and have great demand for insurance products that can help reduce their vulnerability to bad weather, poor health, and volatile markets. New kinds of insurance schemes for the rural poor may offer large returns. As the number of microfinance institutions around the world increases, an emerging issue is how to regulate them. To be safe and sustainable, microfinance institutions must have a clear legal and regulatory framework, which still does not exist in many countries.

Given that private investments in rural financial institutions are still low, the pace of institutional innovation in rural finance is likely to depend on the level of government support. Well-directed support to promising institutions is likely to pay off in both better service to the poor and lower-cost service in the long run. Once viable prototypes have been identified, the private sector will eventually adopt them.
Team Leaders: Manfred Zeller (left IFPRI in 1999) and Manohar Sharma

URBAN FOOD AND NUTRITION

What policies can help reduce hunger and malnutrition in urban areas?

Within the next 20 years, more poor and malnourished individuals in developing countries will live in cities than in the countryside. Even now, malnutrition in the worst areas of cities rivals that found in rural areas. IFPRI conducts research to try to explain the causes of poverty, food insecurity, and malnutrition in urban areas and to analyze policies that affect these problems.

In 1999 IFPRI's team prepared a special issue of the journal *World Development* focused entirely on the topic of urban food security and nutrition. The issue provided an overview of urban issues, gave new data on trends in urban poverty and malnutrition, and summarized IFPRI's comprehensive work in Ghana. Research presented in the issue showed that both the number and the share of poor and malnourished individuals living in urban areas in developing countries are increasing. Different levels of malnutrition between urban and rural areas are due mostly to differences in the levels of critical determinants, like income. Overall estimates of poverty and malnutrition in urban areas are often misleading because malnutrition levels vary more widely within cities than they do in rural areas. Household conditions may vary widely even within neighborhoods, so targeting interventions to the poor based on neighborhood averages may miss many of the truly needy. Finally, the shifts in diets and physical activity levels that accompany urbanization are causing increased obesity and risk of chronic diseases.

Mothers in urban areas are more likely than those in rural areas to work outside the home, which may affect the health and nutrition of their children. In Guatemala IFPRI collaborated with the government-sponsored Community Day Care Centers program, which provides care and meals for children of working mothers. The IFPRI team found that the program was generally well designed and responded to a great need for alternative child care. The quality of services varied widely, and many care providers felt they did not have sufficient training to meet the program's expectations, especially with regard to feeding and early childhood development activities. The IFPRI study recommended that the program reassess its expectations of care providers, consider hiring specially trained personnel to carry out educational activities, and consider raising parents' fees.

Three-quarters of the population of Latin America now lives in cities, and the share is rising. IFPRI examined how this urbanization affected women's participation in the labor force, use of alternative child care, and child feeding and caring practices in six countries. Urban women are more educated and more likely to work outside the home than rural women. Women who work outside the home tend to rely on family members to take care of children. Older daughters commonly take on this responsibility. This, in turn, may compete with the young girl's need and right to go to school. More than 90 percent of urban women initiate breastfeeding, but they tend to discontinue earlier than rural mothers. This may put child nutrition and health at risk. On the positive side, urban mothers provide children with a more diverse range of complementary foods starting at six months of age, including more animal products rich in micronutrients.

Team Leaders: Marie Ruel and James Garrett

Food Policy in Central Asia

Achieving *food and nutrition security is one of the main development objectives of the Central Asian republics—Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, and Uzbekistan. Since independence, these countries have shifted from centrally planned economies to market-oriented systems. Despite great efforts by these countries and the external advice of international and bilateral agencies, their progress in policy reforms has been frustratingly slow, and food insecurity and malnutrition remain high. Unless they can jump-start their economies, the Central Asian countries may face increased poverty, food insecurity, and malnutrition, which could impose enormous social and political costs.*

In 1999 IFPRI initiated a research program on food policy reforms in Central Asia. This program seeks to identify policies and institutional arrangements that facilitate and speed up economic reforms in the food, agriculture, and natural resource sectors that will lead to economic development, poverty reduction, increased food security, (continued)

GENDER AND HOUSEHOLD ASPECTS OF FOOD POLICY

When and how can a better understanding of how men and women interact and make decisions strengthen policy?

The success of policies depends on policymakers' ability to predict how individuals will respond to changing incentives. In many cases, however, individuals act differently than predicted because of how rights, responsibilities, and resources are allocated within households. IFPRI's research in this area will help policymakers develop more effective policies by taking gender and household processes into account.

Based on research in Bangladesh, Ethiopia, Indonesia, and South Africa, IFPRI found that individuals within households have different preferences about the use of household resources, like money and food, and do not necessarily pool their resources. How resources are allocated depends on these different preferences and on individuals' bargaining power. When women control assets, they tend to spend more on their children's education and clothing than men do. But parents do not have identical preferences toward sons and daughters within or across countries.

A study of Bangladesh showed that how assets were distributed in the household affected the health of preschool boys and girls differently. When the mothers had a higher share of assets girls' health improved, whereas when fathers controlled a higher share of assets boys' health improved. Higher transfers from the wife's to the husband's side at marriage (that is, dowry) reduced illness for preschoolers of both sexes, but payments from the husband's side to the wife's side (that is, bride price) were detrimental to boys' health.

Other research in 1999 showed that social capital—that is, people's involvement in formal and informal community groups—can contribute to households' welfare in South Africa and that gender preferences are shifting in the Philippines. In the older generation fathers tended to give more land and more educational opportunities to sons, whereas mothers showed preferences for daughters. Now, sons tend to inherit more land and daughters tend to receive more education.
Team Leader: Agnes Quisumbing

and sustainable use of natural resources. As the program's first activity, IFPRI and Tashkent State Agrarian University organized a regional workshop called "Food, Agriculture, and Natural Resource Policy Research: Setting the Priorities," held July 19–21, 1999, in Tashkent, Uzbekistan.

Workshop participants agreed on a set of issues for which information is urgently needed in order to speed up the economic reform process and to achieve food security in Central Asia. These priority issues include policy research on market reforms, regional trade, food security and agricultural diversification, water use management, and sustainable use of rangelands. IFPRI plans research and outreach activities to provide useful information for designing policies and programs to accelerate the economic reforms and to develop a better capacity for policy analysis in the Central Asian republics.

REDUCING AND PREVENTING POVERTY

What kinds of programs will do most to overcome poverty, food insecurity, and poor nutrition?

At IFPRI researchers are trying to understand the causes of poverty and the effects of programs designed to remedy it as a way of helping policymakers design programs that are more efficient and cost-effective in countries that face a variety of conditions. Besides identifying the poor and determining the effect of interventions on the poor, IFPRI is also studying whether interventions have secondary effects on poverty, comparing different antipoverty interventions, and analyzing the political factors that affect the success of these interventions.

In 1999 the IFPRI team completed research in Egypt focused on reforming that country's food subsidy system and assessing government programs for income and employment generation. At the request of the Egyptian Ministry of Trade and Supply, IFPRI researchers developed a scientific and easy-to-administer method of targeting food subsidies to the people who need them most. They also trained a large group of government staff on how to implement this targeting method. The government of Egypt has agreed to implement this means test in 2000. Research also showed that Egypt is moving from high overall unemployment to unemployment concentrated among specific groups of people—such as young educated women—with poor access to the private sector labor market. The IFPRI team suggested that a policy environment favorable for labor-intensive, export-oriented industries would help absorb these new entrants in the labor market.

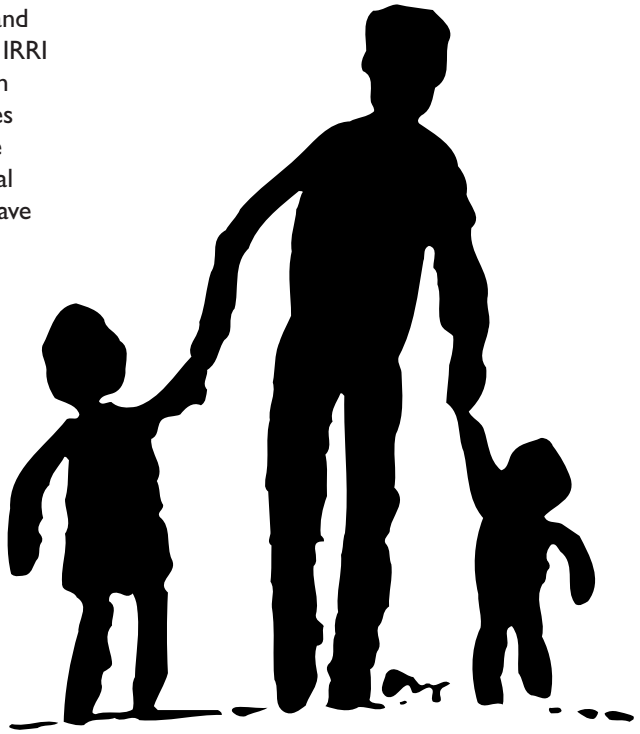
Another project completed in 1999 assessed how well public works programs in the Western Cape province of South Africa reached the poor and raised employment, incomes, and skills. IFPRI researchers found that these programs made important progress but could do better still at meeting their ambitious new goals of not only providing public works like roads, community centers, and other infrastructure but also combating poverty. Projects did not do as well as they could have in hiring women. Projects with community participation had higher levels of labor intensity and created jobs at less cost. Participation in these cases consisted of community organizations choosing workers and serving as liaisons between the community, workers, and project managers. Community participation also helped identify infrastructure priorities and design projects for the greatest benefits to the community.
Team Leader: John Hoddinott

MICRONUTRIENT MALNUTRITION

What are the best ways of getting micronutrients—essential vitamins and minerals—to people whose diets are deficient in these elements?

Micronutrient deficiencies have been dubbed "hidden hunger," because many of the millions of people who suffer from this problem do not associate their listlessness, poor eyesight, inadequate mental and physical development, and frequent illness with a lack of micronutrients. IFPRI leads a CGIAR-wide program to develop appropriate strategies for making micronutrients available to poor people, including by breeding these nutrients into staple food crops.

Researchers from other Future Harvest centers have begun work to breed these nutrients into rice, wheat, maize, beans, and cassava. The findings for rice are particularly encouraging. Aromatic varieties of rice have been found in general to be high in iron and zinc. An aromatic variety identified in the IRRI testing program has 80 percent more iron than standard releases of modern varieties and is high-yielding and insect and disease resistant. Human studies on the nutritional benefits are being planned. Researchers have also found that wheat, maize, and cassava have great potential for delivering vitamin A to humans. In 1999 IFPRI was also a collaborating partner, along with the Johns Hopkins University School of Public Health, Helen Keller International, the Academy for Educational Development, and the International Science and Technology Institute, in a new project called MOST (Micronutrient Operational Strategies and Technologies). Funded by the U.S. Agency for International Development, MOST is seeking to put a range of food-based strategies on the global agenda for micronutrient programs. IFPRI researchers will help supply a greater understanding of the costs of such interventions, their relative effectiveness, and the elements required to sustain them. In 1999 MOST identified 11 countries where the program could make a substantial, measurable difference in the micronutrient status of children and women.
Team Leader: Howarth Bouis



MARKETS AND STRUCTURAL STUDIES

Countries moving from a subsistence or centrally controlled economy to a commercial, market-oriented economy face a difficult period of transition. The Markets and Structural Studies Division seeks to understand how countries can best develop markets, institutions, and infrastructure in ways that contribute to agricultural growth, help alleviate poverty, and ensure food security for all.

RURAL INSTITUTIONS, MARKETS, AND INFRASTRUCTURE

What types of policies are needed to develop competitive and efficient agricultural markets?

In many developing countries economic liberalization has not led to the emergence of efficient, private, and competitive agricultural markets. Evidence suggests that deficient institutions and infrastructure—such as cooperatives, roads, communication networks, and laws that support markets—account for these failures. IFPRI research focuses on the role government can play in building or helping to build institutions and infrastructure that promote efficient agricultural markets and rural income growth.

Food subsidies have long been a fixture in Egypt, providing food security but hampering agricultural growth. For Egyptian policymakers the key question has been whether this trade-off is inevitable. IFPRI research finds that it is not. In recent years, the Egyptian government has introduced market forces in the agricultural and food sectors in order to boost growth. Liberalization has tripled wheat production and attracted private sector investment in wheat milling. The consequent reduction of fine-quality flour prices has benefited consumers. Research suggests that the government could reduce wheat subsidies still further by targeting consumers rather than by intervening in all stages of production. This would protect the poor while improving the efficiency and stability of the emerging private sector in the wheat market.

The rice market in Côte d'Ivoire has also undergone recent liberalization. IFPRI investigated the effects of the reforms on Ivorian farmers, traders, and millers. A more open market has promoted the entry of the private sector into trade and milling, and small-scale millers have been able to compete with large, industrial mills. The amount of local rice entering the market has increased by about 5 percent just a couple of years after reforms were implemented. But because the country does not have a comparative advantage in rice production, it would be cheaper at present for Côte d'Ivoire to maintain its heavy reliance on imports rather than artificially induce domestic production.

In Rwanda the agricultural-input sector has been partially liberalized in the hope that this will boost agriculture out of its present slump. Private Rwandan traders now have the opportunity to buy organic fertilizer from the


European Union at subsidized prices and then sell it on the local market. Unfortunately, a few large commercial importers based in the Rwandan capital have come to dominate the fertilizer distribution market. Lack of access to credit is the key obstacle facing smaller traders who want to increase their involvement in the input market.

IFPRI researchers are synthesizing these and other findings to arrive at a deeper understanding of the reform process, specifically in Sub-Saharan Africa. Results so far suggest that agricultural reforms have fallen short of their goals. The response of the agricultural sector has been constrained by five factors: (1) drought, disease, war, and other exogenous shocks; (2) structural factors—such as research, extension, transport, and communications—that were neglected during reform; (3) inadequate legal and other regulatory systems relating to standards, contracts, and property rights, as well as a lack of good governance; (4) partial implementation of reforms; and (5) the tendency to think that reforms amounted to one-shot events rather than long-term processes of learning-by-doing.
Team Leader: Mylène Kherallah

PROMOTING ECONOMIC GROWTH WITH HIGH-VALUE COMMODITIES

How can developing countries move toward the production of high-value agricultural commodities while making sure the poor participate in this transformation?

To bolster rural economic growth and export earnings, developing-country governments often encourage local producers to shift the composition of their production away from starchy staples and toward higher-value commodities such as horticultural, fish, and animal products. The resulting economic growth, however, can elude smallholders because high-value commodities require better postharvest care, quality control, and marketing knowledge. These requirements pose a challenge even to highly efficient producers. IFPRI research in this area identifies promising markets for high-value agricultural commodities, policies and investments to develop these markets and encourage sustainable production, and the factors that engender the participation of the poor.

A study published in 1999 showed that diets in developing countries are undergoing a dramatic transformation. Per capita consumption of livestock products grew by 50 percent from the early 1970s to the early 1990s alone. Total meat consumption in the developing world will more than double between 1993 and 2020. Although global markets will be able to meet the growing demand for livestock feed without causing an undue rise in cereal prices, the effects of the livestock revolution on smallholders are unclear. A shift to large-scale livestock operations may either allow smallholders to integrate themselves with commercial processors, offering large economies of scale, or it may drive them out of the one sector in which they are currently doing well. Policies and technologies must steer the livestock revolution toward smallholder involvement as well as sustainable production.

Agriculture's contribution to economic growth and poverty alleviation in Tanzania has been a matter of controversy. How this debate is resolved has dramatic implications for policy. Those who see agriculture as stagnant, even

after the reforms of the mid-1980s, propose urban and peri-urban development. Those who see agriculture as more vibrant naturally want to boost that sector. A study completed in 1999 found that agriculture does have the potential to increase overall economic growth in Tanzania, but this will require macroeconomic balance, public sector investment, and improved governance. Farmers growing export crops, for example, receive a larger share of the world price since the reforms, but appreciation of the real exchange rate has offset these gains. The government should set clear priorities for developing smallholder exports. Policy measures would include reducing and harmonizing agricultural taxation, liberalizing regional food trade, providing more accessible agricultural credit, and increasing investment in research and extension.

Team Leader: Christopher Delgado

POSTHARVEST SYSTEMS AND AGROINDUSTRY

How can the growing importance of postharvest activities and agroindustry contribute to rural development?

The declining share of agricultural GDP in most developing countries has reinforced the need to use nonfarm employment to hasten rural development and prevent unsustainable migration to urban areas. The importance of nonfarm employment—much of it coming from postharvest and agroindustrial activities—has grown also because of the rising demand for higher-value-added products, burgeoning opportunities for export-led growth resulting from globalization, and increasing concentration of agroindustry and vertical integration of production. Through the production and employment opportunities they offer, these changes in the rural economy have the potential to contribute to poverty reduction, food security, and sustainable growth, but only if they include the poor. IFPRI researchers are studying ways to raise the incomes of the rural poor through the development of postharvest activities such as agroprocessing and agriculture- and food-based industrialization in rural areas. They are focusing particularly on opportunities for linking small farmers and small enterprises to dynamic national and export markets.

In 1999 the second component of a study of the starch industry in Viet Nam got underway. The first stage provided an overview of the starch production and marketing systems, indicated key policy issues facing the industry, analyzed policy alternatives for accelerating growth, and identified priorities for future research. Results suggest that growth in the industry has been dramatic and that there is a distinct role for small-scale enterprise. In the second stage, researchers are looking for ways to lift the constraints to income diversification and rural industrialization. Data from a supplementary survey of the starch industry is being analyzed.

Also in 1999, IFPRI and nine national and international organizations established Phaction, a global postharvest forum intended to raise the profile and intensify the impact of postharvest research and development.

Team Leader: Francesco Goletti

Strengthening Capacity in Policy Research

***Part of IFPRI's** mission is to leave the countries where it conducts research better equipped to carry out their own research on food and agricultural policies. Its approach to this task focuses on building skills through hands-on implementation of research studies. In 1999 IFPRI's Trade and Macroeconomic Division (TMD), with the assistance and support of the Training and Capacity-Strengthening Program of the Communications Division, successfully applied this approach in a project in Southern Africa.*

As part of its research program on regional trade integration in Southern Africa, TMD conducted a research-cum-training workshop to impart quantitative skills to policy researchers and analysts from local organizations that are currently faced with issues related to regional trade. The participants were asked to identify their most pressing policy problem to use as a case study. In the first session the participants learned basic theoretical skills and then applied techniques for preparing and managing data to real data they had collected from their country. (continued)

TRADE AND MACROECONOMICS

The food and agriculture sectors in developing countries are insulated neither from domestic policies nor from the international economic environment. The Trade and Macroeconomics Division carries out research on how economywide policy reforms in developing countries, in conjunction with sectoral policies, affect agriculture, and in turn equity and growth. It also studies how regional and global trade arrangements affect developing countries, particularly their agriculture.

MACROECONOMIC POLICIES, RURAL DEVELOPMENT, AND THE HOUSEHOLD

How do broad economic policy reforms affect agricultural performance, natural resource use, poverty, and equity in developing countries?

In many developing countries, poor agricultural performance has led to poor overall economic performance in recent decades. As a result, many countries have adopted significant trade and macroeconomic policy reforms, often without carefully considering the impact on the agricultural sector and the role for complementary policies. To generate knowledge that can help in the design of future policies, IFPRI is conducting a series of country studies, predominantly in Sub-Saharan Africa but including countries from all four developing regions. In 1999, studies on the effects of policy reforms and trade liberalization proceeded in Botswana, Madagascar, Malawi, Mozambique, South Africa, Tanzania, Zambia, and Zimbabwe in Sub-Saharan Africa; Egypt, Morocco, and Tunisia in North Africa/Middle East; Indonesia in Asia; and Brazil and Venezuela in South America.

Results indicate that policy packages often are attractive since they can mitigate negative side effects of individual policies. For example, trade liberalization alone can increase national income by reallocating income to more productive sectors, but it can worsen income inequality. By undertaking complementary policies, such as an effective land reform or educational programs targeted to poor women, countries can ensure that the poor share in the benefits of the new policies. Combining a complementary package of policies tailored to local needs with macroeconomic policy reforms can improve general welfare and simultaneously protect the poor from adverse effects of policy changes.

Since, in most developing countries, the poor are found in greater numbers in rural areas, accelerated agricultural growth and rural development are crucial for jump-starting national economies. But agricultural growth alone is not enough to sustain economic growth. Broad-based rural income growth linked to labor-intensive nonagricultural expansion in both rural and urban areas is critical. Governments can enhance the posi-

Hands-on computer-based exercises introduced computational methods for solving economy-wide models.

The trainees then had four months to formulate their problem, to identify and organize data sets, and to initiate policy analysis. In the second session the participants reconvened to learn more about how to apply the techniques learned. At the conclusion, participants could identify and analyze a policy issue in a way that would be of relevance and immediate use to policymakers in their countries.

This approach offers several advantages. First, the real-world orientation—training individuals who are already doing policy research, focusing on actual policy problems—makes training more relevant and useful and speeds up the adoption of new skills. Second, the use of the trainees' results in regular policymaking increases the demand for research-based information for decisionmaking. And third, gathering policy researchers and analysts from different countries who face similar policy issues allows them to integrate their skills and research solutions at the regional level.

tive growth effects of macroeconomic policy changes by investing in rural infrastructure such as roads, in agricultural research and extension services, and in human resources; by removing policy biases against agriculture; and by improving rural financial services.

In Sumatera, Indonesia, for example, IFPRI found that a 40 percent devaluation of the rupiah would raise demand for forest products, thus increasing deforestation. Production of tree crops such as coffee, oil palm, and rubber would expand, while production of food crops, except rice and sugar, would decline. Imposing a 20 percent export tax on processed wood products would effectively offset the additional harvesting of trees induced by the devaluation.
Team Leader: Romeo Bautista

GLOBAL AND REGIONAL TRADE

What effects do trade arrangements and disturbances such as the Asian financial crisis have on agriculture, the rural economy, and the poor?

Recovery from the Asian crisis, continued world trade liberalization under the World Trade Organization (WTO), and the development of new regional trading arrangements will greatly affect the world economy in coming years and determine the world trade environment in which developing countries must operate. In examining the impact of various regional trade agreements, preliminary results indicate that such agreements generally increase welfare. For example, it appears that the recently signed South Africa–European Union bilateral free trade agreement will have little effect on the other countries of Southern Africa, but widening the free trade area to include these countries benefits them greatly. IFPRI research indicates that these countries stand to gain more from zero-tariff access to European markets than from a 50 percent reduction in global tariffs.

Another world trade issue to be addressed is the question of whether trade liberalization hurts poor consumers and small producers in developing countries. Some people have raised concerns that trade liberalization may hurt the poor by leading to more unstable food prices and may displace small domestic producers because of cheap food imports. IFPRI work in 1999 showed that trade reforms could lead to greater productivity and economic growth in developing countries—changes that could help the poor. Trade talks have led to special provisions for developing countries to allow them to assure food security for their people, but these provisions must be accompanied by domestic policies that also promote stable prices and poverty alleviation. While Latin America is a net exporter of agricultural goods, Latin American countries that import food, such as Mexico and Venezuela, will want to pay close attention to WTO talks regarding a Free Trade Area of the Americas, which could increase their food bills.

Finally, IFPRI research is addressing world trade issues raised by genetically modified agricultural products on several fronts, including the implications for international intellectual property rights agreements and the proper administration of the WTO agreement on technical barriers to trade, such as the labeling of genetically modified products.
Team Leader: Sherman Robinson

COMMUNICATIONS

Cutting-edge policy research needs to be communicated in a way that promotes action and ensures that the poor benefit. Through its publications, seminars and workshops, website, and media relations, IFPRI provides information that guides policymaking, strengthens developing-country capacity for food policy research, and promotes awareness of issues concerning food policy so that it can have a positive impact on the livelihoods of the poor.

In 1999 IFPRI changed the name of its Outreach Division to the Communications Division and hired Klaus von Grebmer as division director. The mandate of the Communications Division is to promote IFPRI's mission—conducting research to meet the food needs of the developing world on a sustainable basis—and communicate the results in a way that enhances the Institute's impact on food policy.

INFORMATION PROGRAM

How can IFPRI effectively communicate its research results to its key stakeholders?

Through publications, media relations, and the World Wide Web, IFPRI is reaching a broad range of people with its research, including academics, development professionals, policymakers and policy analysts, opinion formers, and the general public.

In 1999 IFPRI published two research reports and abstracts, one food policy report, three food policy statements, two working papers on microcomputers in policy research, three 2020 Vision discussion papers, six 2020 Vision briefs, two sets of 2020 Vision focus briefs, three issues of *News & Views* (the 2020 Vision newsletter), and the annual report. A new newsletter, *IFPRI Research Perspectives*, replaced *IFPRI Report* and will be published three times a year. Together with Johns Hopkins University Press, IFPRI published *Paying for Agricultural Productivity*, edited by Julian M. Alston, Philip G. Pardey, and Vincent H. Smith. This book examines the significant changes taking place in the financing of agricultural research and development in five countries—Australia, the Netherlands, New Zealand, the United Kingdom, and the United States. Also appearing in 1999 was a French edition of IFPRI's book *Good News from Africa*, an account of how agricultural research has affected the lives and livelihoods of individuals and communities in Africa. IFPRI also published *Research That Matters*, a booklet containing six case studies showing how IFPRI's research findings are communicated to and

used by policymakers. During the year more than 3,000 individuals requested about 33,000 copies of IFPRI publications.

Users of IFPRI research are increasingly gaining access to the information they need via IFPRI's website. Visitors to www.ifpri.org get information about IFPRI research activities, research staff, IFPRI datasets, upcoming IFPRI events, and links to relevant websites. They will also find electronic versions of nearly all of IFPRI's recent publications. By the end of 1999, some 360 publications were available in PDF format. Some web publications are also available in French, Spanish, and Portuguese. More and more visitors are also requesting print versions of publications through the new web-based ordering system. A new section for the media presents news releases, recent clips, and information on how to reach IFPRI staff for interviews.

The mainstream media in developed and developing countries are an important avenue for publicizing IFPRI's research and findings. Articles about IFPRI research appeared in many newspapers and magazines in 1999, including *Business World* (the Philippines), *China Daily*, *Le Courier* (France), *Daily Nation* (Kenya), *The Guardian* (United Kingdom), *The Hindu* (India), *Ghanaian Times*, *Kristeligt Dagblad* (Denmark), *New Republic* (United States), *Politiken* (Denmark), *St. Louis Post-Dispatch* (United States), *Viet Nam News*, and the *Wall Street Journal* (United States). In October 1999 an opinion piece on agricultural biotechnology by IFPRI Director General Per Pinstrup-Andersen appeared in the *Washington Post* and the *International Herald Tribune*. IFPRI's work was also featured in television and radio broadcasts worldwide, such as on the U.S. public television program "Think Tank with Ben Wattenberg," a national radio show in Jamaica, a Kenyan television news program, and a Dutch public television show. These and other articles and broadcast appearances help educate policymakers and opinion formers about food policy issues and spread IFPRI's message beyond policy and academic audiences.

Program Head: Don Lippincott (left IFPRI in 2000)

POLICY SEMINARS

How can IFPRI disseminate the results of its research and foster dialog on food security issues in workshops and conferences?

The Policy Seminars Program helps stimulate dialog on the topics relevant to IFPRI's work by organizing workshops and conferences around the world. The group coordinates IFPRI's Policy Seminars Series, which presents the results of recent research on topics of interest to IFPRI and its partners and clients. It also helps organize 2020 Vision panel discussions and seminars to introduce IFPRI work to the Washington development community.

Program Head: Laurie Goldberg

1999 Seminars, Workshops, & Conferences

Workshops, Symposia, & Meetings

Inter-Centre Working Group on Genetic Resources Workshop, Washington, D.C., January 25–29

Symposium on Food Policy in Viet Nam, Cambodia, Laos, and Myanmar: The Effects of Globalization, Viet Nam, March 1–2

Hunger in the 21st Century: Action Strategies for Food Security, Meeting of the 2020 Vision Initiative International Advisory Committee, Ghana, April 14–15

Workshop on Ending Hunger in the 21st Century, Washington, D.C., April 28–29

Impact of Agricultural Research on Poverty Reduction: Design Workshop, Washington, D.C., May 12–14

Strengthening Development Policy through Gender Analysis: External Advisory Committee Meeting, Washington, D.C., May 20–21

Workshop on a Livestock Strategy for the Next Decades, Washington, D.C., June 2–3

Workshop on Improving Human Nutrition through Agriculture: The Role of International Agricultural Research, the Philippines, October 5–7

The WTO Round and Food Security for USAID Partner Countries: An Economic Growth Training Workshop, Washington, D.C., November 1–2

Policy Seminars

Famine in North Korea: Causes and Cures, Sherman Robinson, IFPRI, and Marcus Noland, Institute of International Economics, January 21

Soil Degradation: A Threat to Developing-Country Food Security? Sara Scherr, University of Maryland, February 18

The Effectiveness of Foreign Aid, Henrik Hansen, Danish Royal Veterinary and Agriculture University, and Finn Tarp, University of Copenhagen, February 24

Does Care Really Matter for Child Nutrition? Marie Ruel, IFPRI, March 25

International Collaboration in Agricultural Research: What's at the End of the Tunnel? Prabhu Pingali, International Maize and Wheat Improvement Center (CIMMYT), April 8

Food Policy for Developing Countries: Emerging Issues and Unfinished Business, Per Pinstrup-Andersen, IFPRI, May 6

World Population Dynamics: What Do They Imply for Food Security? Margaret Cately-Carlson, May 10

The Global Burden of Disease: The 1990s and Beyond, Alan Lopez, World Health Organization, July 15

An Ecological and Historical Perspective on Rural Sector Development in Southeast Asia, Yujiro Hayami, Aoyama-Gakuin University, Japan, September 10

The Landscape of the Millennium Agricultural Round for Developing Countries, Carole Brookins, World Perspectives Inc., September 23

Water Resource Policies in India: Past Experience and Future Directions, Yoginder Alagh, Member of Parliament, and Sardar Patel, Institute of Economic and Social Research, India, November 12

China's Accession to WTO: What Impact Will It Have on National Food Security? Jikun Huang, Center for Chinese Agricultural Policy, November 16

Prospects for India's Cereal Supply and Demand to 2020, Peter Hazell, IFPRI, November 30

Policy Reform in American Agriculture: Prospects and Implications through 2002, David Orden, Virginia Tech, and Robert Paarlberg, Wellesley College, December 2

Cash Transfer Programs: Do They Reduce Poverty? Lessons from Mexico, Elizabeth Sadoulet and Alain de Janvry, University of California at Berkeley and the World Bank, December 14

2020 Panel Discussions

Getting Ready for the Millennium Round Table Trade Negotiations: What Does the Agenda Look Like for Developing Nations? Eugenio Diaz-Bonilla and Sherman Robinson, IFPRI, April 22

Livestock to 2020: The Next Food Revolution, Christopher Delgado, IFPRI; Lester Brown, WorldWatch Institute; Henning Steinfeld, Food and Agriculture Organization of the United Nations; Simeon Ehui, International Livestock Research Institute; Gary Valen, Humane Society of the United States; Montague Yudelman, World Wildlife Fund; and Rajul Pandya-Lorch, IFPRI, June 1

Biotechnology for Developing-Country Agriculture: Problems and Opportunities, Richard Flavell, Ceres, Inc.; Anatole Krattiger, International Service for the Acquisition of Agri-biotech Applications at Cornell University; Gabrielle Persley, World Bank and IFPRI; and Peter Hazell, IFPRI, October 18

Book Launching Seminars

Alleviating and Preventing Famine, Joachim von Braun, Center for Development Research, and Patrick Webb, Tufts University, January 13

The Doubly Green Revolution: Food for All in the 21st Century, Gordon Conway, Rockefeller Foundation, May 19

Paying for Agricultural Productivity, Daniel Newlon, National Science Foundation; Phil Pardey, IFPRI; and Vincent Smith, Montana State University, October 20



TRAINING AND CAPACITY STRENGTHENING

How can IFPRI help make its developing-country partners better able to conduct food policy research and analysis?

IFPRI takes seriously its commitment to help developing countries establish their own capacity for conducting research on food and agricultural policies. To this end, IFPRI's Training and Capacity-Strengthening Program supports IFPRI researchers in their training activities. For example, in 1999 the program helped researchers design and implement a research-cum-training workshop for Southern African policy analysts called "Quantitative Multi-Sector Policy Analysis," as described on pages 34-35.

In addition to working closely with IFPRI researchers, the Training and Capacity-Strengthening Program supports the training activities of other organizations. In 1999 IFPRI worked with regional organizations such as the Southern Africa Development Community and the Association for Strengthening Agricultural Research in Eastern and Central Africa; national institutions such as the State Agricultural Universities of China and the Indian Council for Agricultural Research; and academic institutions around the world, such as Tufts University, University of Bonn, University of Nairobi, and the Indian Agricultural Research Institute.

The program also initiated efforts to develop an informal network of food policy training institutions. IFPRI is compiling a database of organizations conducting food policy training, creating a calendar of upcoming training events, and offering ongoing support to these organizations with IFPRI training materials and publications.
Program Head: Suresh Babu

A 2020 VISION

FOR FOOD,
AGRICULTURE, AND THE ENVIRONMENT

The 2020 Vision for Food, Agriculture, and the Environment initiative is IFPRI's primary vehicle for raising public awareness and stimulating a global dialog about the challenges and opportunities related to feeding the world, alleviating poverty, and protecting the earth. During 1999 an independent assessment found that the initiative had led to new thinking and new action among members of its target audience. 2020 materials and activities had the greatest impact on international researchers and educators but also reached the hands of international policy leaders.

In 1999 the initiative accomplished its goals through a number of research and communication activities, including the following highlights.

A major 2020 study of the livestock sector concluded that a "livestock revolution" is underway in developing countries with profound implications for human health, livelihoods, and the environment. From the early 1970s to the mid-1990s, the volume of meat consumed in developing countries grew almost three times as much as it did in developed countries. The study projects that in the next 20 years meat consumption in developing countries will grow four times faster than in developed countries. This transformation in eating habits can improve the economic and nutritional well-being of many rural poor. But much could go wrong if long-run policies and investments fail to meet consumer demand, to direct income growth opportunities to those who need them most, and to alleviate environmental and public health stress.

The 2020 Vision initiative also launched a new publication series—2020 Focus—to communicate different perspectives on important topics of global concern. Each set of focus briefs is commissioned from leading experts and edited by a specialist of international repute. In 1999 two collections of briefs were published. The first focused on the negotiating agendas that eight major regions and economic groupings would bring to the Millennium Round trade negotiations. The policy briefs emphasized the need for transparency and lack of distortion in the global trading regime along with special treatment for developing countries. The second collection sorted through the seemingly unbridgeable public debate about biotechnology to explore the risks and benefits developing countries will face when adopting this technology, and the roles the private sector, intellectual property management, and policies will play in the dissemination of this tool.



The 2020 IMPACT model, recognized as one of the world's premier models for global projections of world food demand, supply, and trade, was updated and extended during the year. The updated projections and analysis, published as a report, show that almost all of the increased demand for food between 1995 and 2020 will come from the developing world. Despite this higher demand, a developing-country person in 2020 will consume less than half the amount of cereals consumed by a developed-country person and slightly more than one-third of the meat products. Only strong action by the international community will eliminate food insecurity and malnutrition in the developing world by 2020.

As Indians consume more and more livestock products like milk, meat, and eggs, the country's demand for cereal for use as feedgrain could soon outpace supply, according to another 2020 study published during 1999. Under the most plausible projections, India's cereal gap will fall somewhere between 46 and 64 million metric tons in 2020. Cereal shortages and trade imbalances can be avoided if India adopts appropriate policies. The study's findings, which were presented to about 70 researchers and government officials in New Delhi, have helped direct renewed attention to the prospects and effects of changing diets in India.

During 1999 these and other results were published in one food policy report, three discussion papers, six policy briefs, two foci, and three issues of the 2020 newsletter, *News & Views*. These publications gained a wider audience through the growing popularity of the 2020 webpage. More than 40,000 people visited the webpage during the year, with more than 30 percent of these visitors coming back eight or more times.

Policy seminars and panel discussions accompanied the publication of some of these studies. In all, three policy seminars, three panel discussions, and other general meetings, including the fourth meeting of the 2020 International Advisory Committee (IAC), were held in 1999. The panel discussions have attracted large audiences from the academic, government, nongovernmental organization, and media communities.

The most important meeting of the year for the 2020 initiative was the IAC meeting in Accra, Ghana. The meeting was structured as an international consultation on emerging issues in global food security, poverty alleviation, and natural resource management.

The primary objectives of the meeting were to pinpoint the knowledge gaps that need to be filled in order to realize the 2020 Vision and to delineate the next steps for the initiative. The IAC, which comprises heads of donor agencies, policymakers from developing countries, leaders in civil society, and researchers from around the world, is chaired by President Yoweri K. Museveni of Uganda.

The year also saw the successful completion of the first phase of the 2020 Vision Networks for East and West Africa. These research networks, established in 1998 at the behest of African countries, aim to improve policymaking through policy research, publications, training of policy analysts, and dialog between decisionmakers, civil society leaders, and researchers.

During the course of the year, seminars were held in 11 network countries to share with policymakers and other stakeholders the country-specific priorities for research and capacity strengthening that will be undertaken during the second phase. Funding permitting, the second phase will begin country and regional research, training and capacity strengthening, and information dissemination activities.

COLLABORATION

In 1999 IFPRI collaborated with more than 230 local, national, regional, and international institutions (see below). The local and national institutions include government agencies, universities, research organizations, and NGOs. The map below shows what kinds of local and national institutions IFPRI worked with in each collaborating country.


UZBEKISTAN
SYRIA
LEBANON
IRAQ
JORDAN
LIBYA
EGYPT
CHINA
PAKISTAN
BANGLADESH
INDIA
VIET NAM
PHILIPPINES
ETHIOPIA
UGANDA
KENYA
RWANDA
TANZANIA
INDONESIA
ZAMBIA
MALAWI
ZIMBABWE
MADAGASCAR
MOZAMBIQUE
AUSTRALIA
SOUTH AFRICA
NEW ZEALAND

COLLABORATING INSTITUTIONS IN DEVELOPING COUNTRIES

AFRICA

BENIN
Laboratoire d'Analyse Regionale et d'Expertise Sociale

CÔTE D'IVOIRE
Centre Ivoirien de Recherches Economiques et Sociales

ETHIOPIA
Addis Ababa University
Bureau of Agriculture, Tigray, Amhara, and Oromia
Bureau of Planning and Economic Development, Tigray, Amhara, and Oromia
Ethiopian Agricultural Research Organization
Mekelle University, Tigray
Ministry of Agriculture

GHANA
Ministry of Food and Agriculture
Ministry of Health
University of Ghana, Legon
University of Science and Technology, Kumasi

KENYA
Kenya Women's Financial Trust
Tegemeo Institute of Egerton University
University of Nairobi
University of Nairobi, Kabete

MADAGASCAR
Institut National de Recherches Appliquées au Développement Rural (FOFIFA)
Ministry of Agriculture
Ministry of Research and Development

MALAWI
Agricultural Policy Research Unit, Bunda College of Agriculture
Bunda College of Agriculture
Center for Social Research
Malawi Rural Finance Company
Ministry of Women, Children, Community Development and Social Welfare
National Economic Council
National Education Council
National Statistical Office

MALI
Ministère du Développement Rural et de l'Environnement

MOZAMBIQUE
CARE-Mozambique
Eduardo Mondlane University
Ministry of Planning and Finance
Poverty Alleviation Unit, Ministry of Planning and Finance

RWANDA
Ministry of Agriculture and Rural Development

SOUTH AFRICA
Agricultural Business Chamber
Data Research Africa
Land and Agricultural Policy Center
Policy and Praxis
University of Natal in Pietermaritzburg
University of the North in Pietersburg
University of Pretoria
University of Stellenbosch

TANZANIA
Economic and Social Research Foundation
Institute of Development Management
Ministry of Agriculture and Cooperatives
Planning Commission, the President's Office
University of Dar es Salaam

UGANDA
Agricultural Policy Secretariat, Ministry of Finance, Planning and Economic Development
Kawanda Agricultural Research Institute
Makerere University
Ministry of Agriculture
National Agriculture Research Organization

ZAMBIA
Institute for Economic and Social Research
University of Zambia

ZIMBABWE
EcoNomics Africa
Ministry of Lands, Agriculture and Rural Settlement
University of Zimbabwe

ASIA

BANGLADESH
Association for Social Advancement
Bangladesh Institute of Development Studies
Bangladesh Institute for Nutrition and Food Science
Bangladesh Rural Advancement Committee
Data Analysis and Technical Assistance
Export Bureau, Ministry of Commerce
Ministry of Commerce
Ministry of Food and Agriculture
Rangpur-Dinajpur Rural Services
University of Dhaka

CHINA
Center for Chinese Agricultural Policy
Chinese Academy of Agricultural Sciences
State Development and Planning Commission

INDIA
Banker's Institute of Rural Development, National Bank for Agriculture and Rural Development
Institute for Social and Economic Growth
Institute of Economic Growth
Jawaharlal Nehru University
National Center for Agricultural Policy Research
National Council of Applied Economics Research
National Institute for Rural Development
Society for Helping, Awakening Rural Poor through Education

INDONESIA
Agency for Agricultural Research and Development
Center for Agro-Socio Economic Research
Lembaga Demografi
Ministry of Agriculture
University of Indonesia
University of Jambi

PAKISTAN
Ministry of Food
Pakistan Institute of Development Economics

PHILIPPINES
Philippine Institute of Development Studies
South East Asian Research Center for Agriculture
University of the Philippines

UZBEKISTAN
Ministry of Agriculture and Water Resources
Tashkent State Agrarian University

VIET NAM
Development Strategy Institute, Ministry of Planning and Investment
Fruits and Vegetables Research Institute
General Statistics Office
Ministry of Agriculture and Rural Development
Ministry of Planning and Investment
National Institute of Agricultural Projections and Planning
National Institute of Soils and Fertilizers
Postharvest Technology Research Institute
Viet Nam Agricultural Science Institute

LATIN AMERICA AND THE CARIBBEAN

ARGENTINA
Secretaría de Agricultura, Ganadería, Pesca y Alimentación

BRAZIL
Empresa Brasileira de Pesquisa Agropecuária
Instituto de Pesquisa Economica Aplicada

COSTA RICA
Instituto Interamericano para la Cooperación en Agricultura

ECUADOR
Center for Population Studies
Instituto Nacional de Investigaciones Agropecuarias

GUATEMALA
Community Day Care Program of the Secretary of Social Work of the First Lady of Guatemala
Institute of Nutrition of Central America and Panama

HONDURAS
Programa de Asignación Familiar

MEXICO
Colegio de Mexico
Instituto Nacional de Investigaciones Forestales, Agrícolas y Pecuarias
Programa Nacional de Educacion, Salud, y Alimentacion, Government of Mexico

NICARAGUA
Asociación de Consultores para el Desarrollo de la Pequeña Empresa

PARAGUAY
Dirección de Investigación Agrícola

URUGUAY
Instituto Nacional de Investigación Agropecuaria

VENEZUELA
Fundación Polar
Ministerio de Agricultura y Cría
Ministerio de la Producción

NORTH AFRICA/MIDDLE EAST

ALGERIA
Haute Commission de Développement de la Steppe
Institut Technique des Grandes Cultures

EGYPT
Ain Shams University
American University in Cairo
Assiut University
Cairo University
El Azhar University
Ministry of Agriculture and Land Reclamation
Ministry of Trade and Supply
Zagazig University

IRAQ
IPA Agricultural Research Center

JORDAN
Jordan University of Science and Technology
Ministry of Agriculture
National Center for Agricultural Research and Technology Transfer
University of Jordan

LEBANON
Agricultural Research Institute
American University
Lebanese University

LIBYA
Agricultural Research Center

MOROCCO
Centre Regional de Recherche Agricole
Institut Agronomique et Veterinaire
Institut National de la Recherche Agronomique
Ministry of Agriculture

SYRIA
Aleppo University
Directorate of Agricultural and Scientific Research
Ministry of Agriculture and Agrarian Reform
Steppe Directorates in Palmyra and Aleppo
Syrian Ministry of Agriculture and Agrarian Reform

TUNISIA
Ecole Nationale d'Agriculture de Mograne
Institut d'Economie Quantitative, Ministry of Economic Development
Institut National de Recherche Agronomique de Tunisie
Ministry of Agriculture

COLLABORATING INSTITUTIONS IN DEVELOPED COUNTRIES

AUSTRALIA AND NEW ZEALAND

ANZDEC Limited, New Zealand
Australian Centre for International Agricultural Research, Australia
Lincoln University, New Zealand
Waite Agricultural Research Institute, Australia

EUROPE

BELGIUM
Katholieke Universiteit Leuven

DENMARK
Royal Veterinary and Agricultural College
University of Copenhagen

GERMANY
Center for Development Research (ZEF), University of Bonn
German Agency for Technical Cooperation (GTZ)
German Foundation for International Development (DSE)
University of Göttingen
University of Hannover
University of Hohenheim
University of Kiel

NETHERLANDS
Free University
International Soil Reference Information Centre

NORWAY
Agricultural University of Norway

SWITZERLAND
Swiss Federal Institute of Technology

UNITED KINGDOM
Center for the Study of African Economies, Oxford University
Manchester University
Oxford University
Sheffield University

NORTH AMERICA

CANADA
School of Rural Planning and Development, University of Guelph

UNITED STATES
Academy for Educational Development
Brown University
Columbia University
Conservation International
Cornell University
Economic Research Service, United States Department of Agriculture
Eros Data Center, United States Geological Service
Helen Keller International
Institute for International Economics
International Science and Technology Institute
International Food Security Treaty Campaign
Johns Hopkins University
Kenyon College
Laboratory for Global Remote Sensing Studies, University of Maryland
Land Tenure Center, University of Wisconsin-Madison
Montana State University
Ohio State University

Plant, Soil, and Nutrition Laboratory, Agricultural Research Service, United States Department of Agriculture
Purdue University
RAND Corporation
Save the Children
Stanford University
Tufts University
United States Agency for International Development
University of California, Berkeley
University of California, Davis
University of California, Los Angeles
University of Florida
University of Illinois
University of Minnesota
U.S. Naval Academy
Virginia Polytechnic Institute and State University
Western Human Nutrition Research Center, Agricultural Research Service, United States Department of Agriculture
Winrock International
World Resources Institute

INTERNATIONAL AND REGIONAL ORGANIZATIONS

Administrative Committee on Coordination/ Sub-Committee on Nutrition, United Nations
Asian Development Bank
Asian Vegetable Research and Development Center
Caribbean Agricultural Research and Development Institute
Center for International Forestry Research
Centre for Health and Population Research (ICDDR,B)
Centro Internacional de Agricultura Tropical
Consultative Group to Assist the Poorest
Food and Agriculture Organization of the United Nations
Inter-American Development Bank
International Center for Agricultural Research in the Dry Areas
International Center for Living Aquatic Resources Management
International Centre for Research in Agroforestry
International Crops Research Institute for the Semi-Arid Tropics
International Fertilizer Development Center
International Fund for Agricultural Development
International Institute for Applied Systems Analysis
International Institute of Tropical Agriculture
International Livestock Research Institute
International Maize and Wheat Improvement Center (CIMMYT)
International Potato Center (CIP)
International Plant Genetic Resources Institute
International Rice Research Institute
International Service for National Agricultural Research
International Water Management Institute
Population Council
Programa Cooperativo para el Desarrollo Tecnológico Agropecuario del Cono Sur
United Nations Industrial Development Organization
West Africa Rice Development Association
World Bank

1999 PUBLICATIONS

If you are interested in any of the topics below, please consult the list of publications that follows. The list contains IFPRI publications and other material written by IFPRI staff published during 1999. It is alphabetized by first IFPRI author. The numbers in the index correspond to the numbers in the publications list. Works published by IFPRI are in purple.

1. **Adato, Michelle** (with Lawrence Haddad, D. Horner, N. Ravjee, and R. Haywood). *From Works to Public Works: The Performance of Labour-Intensive Public Works in Western Cape Province, South Africa*. Report prepared for the Department for International Development (DFID) and the Rockefeller Foundation.

2. **Ahmed, Akhter** (with R. Assaad and F. El-Hamidi). *The Determinants of Employment Status in Egypt*. Report prepared for the U.S. Agency for International Development.

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133. Robinson, Sherman (with M. Noland, L. Liu, and Z. Wang). (Updated in August.) *Global Economic Effects of the Asian Currency Devaluations*. Policy Analyses in International Economics Series 56. Washington, D.C.: Institute for International Economics.

135. Robinson, Sherman (with A. Yuñez-Naude, R. Hinojosa-Ojeda, J. Lewis, and S. Devarajan). From Stylized to Applied Models: Building Multisector CGE Models for Policy Analysis. *North American Journal of Economics and Finance* 10: 5-38.

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137. Rosegrant, Mark (with K. Easter and A. Dinar). Formal and Informal Markets for Water: Institutions, Performance, and Constraints. *World Bank Research Observer* 14 (1): 99-116.

138. Rosegrant, Mark (with R. Evenson and C. Pray). *Agricultural Research and Productivity in India*. Research Report 109. Washington, D.C.: IFPRI. (Four-page abstract available in English, French, and Spanish)

139. Rosegrant, Mark (with Claudia Ringler and R. Gerpacio). Water and Land Resources and Global Food Supply. In *Food Security, Diversification and Resource Management: Refocusing the Role of Agriculture?*, ed. G. Peters and J. von Braun. Aldershot, U.K., and Brookfield, Vt., U.S.A.: Ashgate Publishing.

140. Rosegrant, Mark (with Ximing Cai, Claudia Ringler, A. Keller, G. Donoso, and D.C. McKinney). *Integrated Economic-hydrologic Water Modeling at the River Basin Scale: The Maipo River Basin in Chile*. Report prepared for the Inter-American Development Bank.

141. Ruel, Marie (with James Garrett). Overview. *World Development* 27 (11): 1885-1889.

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143. Ruel, Marie (with P. Menon and Saul Morris). Socio-economic Differentials in Child Stunting Are Consistently Larger in Urban than Rural Areas: Analysis of 10 DHS Data Sets. *FASEB Journal* 13: A453.

144. Ruel, Marie (with M. Armar-Klemesu, D. Maxwell, Carol Levin, and Saul Morris). The Constraints to Good Child Care Practices in an Urban Environment: Findings from Accra, Ghana. *FASEB Journal* 13: A879.

145. Ruel, Marie (with Carol Levin, M. Armar-Klemesu, D. Maxwell, and Saul Morris). Good Care Practices Mitigate the Negative Effects of Poverty and Low Maternal Schooling on Children's Nutritional Status: Evidence from Accra. *World Development* 27 (11): 1993-2009.

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148. Schiøler, E. *De bonnes nouvelles d'Afrique: Fermiers, recherche, agronomique, et ventres pleins,* translated from *Good News from Africa: Farmers, Agricultural Research, and Food in the Pantry* (published in 1998). Washington, D.C.: IFPRI.

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154. **Skoufias, Emmanuel**. Parental Education and Child Nutrition in Indonesia. *Bulletin of Indonesia Economic Studies* 35 (1): 99-119.

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156. **Wood, Stanley** (with F. Nachtergaele, D. Nielsen, A. Dai, and K. Sebastian). Spatial Aspects of the Design and Targeting of Development Strategies for Fragile Lands. In *Strategies for Poverty Alleviation and Sustainable Resource Management in the Fragile Lands of Sub-Saharan Africa*, ed. Anna Knox-McCulloch, Suresh Babu, and Peter Hazell. Feldafing, Germany: Food and Agriculture Development Center, German Foundation for International Development (ZEL/DSE).

157. **Yohannes, Yisehac** (with P. Webb). *Classification and Regression Trees, CART: User Manual for Identifying Indicators of Vulnerability to Famine and Chronic Food Insecurity*. Microcomputers in Policy Research 3 (with diskette). Washington, D.C.: IFPRI.

158. **Zeller, Manfred**. The Role of Rural Financial Services for Alleviation of Food Insecurity and Poverty. *Agriculture and Rural Development* 6 (2): 28-32.

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161. **Zeller, Manfred** (with Manohar Sharma), eds. *Innovations in Microfinance for the Rural Poor: Exchange of Knowledge and Implications for Policy*. Proceedings of the workshop organized by the German Foundation for International Development (DSE), IFPRI, the International Fund for Agricultural Development, and the Bank of Ghana, Accra, November 8-13, 1998. Feldafing, Germany: DSE.

162. **Zeller, Manfred** (with C. Lapenu, B. Minten, E. Ralison, D. Randrianaivo, and C. Randrianarisoa). Pathways of Rural Development in Madagascar: An Empirical Investigation of the Critical Triangle between Environmental Sustainability, Economic Growth, and Poverty Alleviation. *Quarterly Journal of International Agriculture* 28 (2): 105-128.

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164. ———. *How Different Is the Measure of Inequality and Polarization?* Working Paper 99-02. Ithaca, N.Y., U.S.A.: Department of Agricultural, Resource, and Managerial Economics, Cornell University.

165. **Zhang, Xiaobo** (with T. Mount and R. Boisvert). Food Demand in China: Lessons from Guangdong Province. Working Paper 98-02. Ithaca, N.Y., U.S.A.: Department of Agricultural, Resource, and Managerial Economics, Cornell University.

In 1999 IFPRI also published its 1998 annual report, two issues of *Research Perspectives* (the IFPRI newsletter), and three issues of *News & Views*, the newsletter of the 2020 Vision initiative. Both newsletters are available in French and Spanish.

FINANCIAL STATEMENTS

Presented here is a summary of financial information for the years ended December 31, 1999 and 1998. The full financial statements and the independent auditors' report are available from IFPRI on request.

Balance Sheets

December 31, 1999 and 1998 (US$ thousands)

Assets		1999	1998
Current assets	Cash and cash equivalents	$ 7,372	$ 4,055
	Investments	6,804	4,913
	CGIAR grants receivable	721	554
	Restricted projects receivable (net)	1,913	1,284
	Other receivables	299	498
	Other current assets	290	94
	Total current assets	17,399	11,398
Other assets	Property and equipment, net	666	698
	Total assets	$ 18,065	$ 12,096
Liabilities and net assets			
Current liabilities	Accounts payable	$ 647	$ 979
	Accrued vacation	614	583
	Advance payment of CGIAR grant funds	2,475	160
	Deferred rent (current portion)	—	—
	Unexpended restricted project funds	6,365	3,859
	Other liabilities	18	61
	Total current liabilities	$ 10,119	$ 5,642
Noncurrent liabilities	Deferred rent	737	577
	Accrued post-retirement benefits	507	453
	Total noncurrent liabilities	1,244	1,030
	Total liabilities	11,363	6,672
Net assets—unrestricted	Operating reserves	3,569	2,971
	Reserves allocated for subsequent year expenditure	2,467	1,755
	Net investment in property and equipment	666	698
	Total net assets	6,702	5,424
	Total liabilities and net assets	$ 18,065	$ 12,096

Statements of Revenue, Expenses, and Changes in Operating Reserves

For the Years Ended December 31, 1999 and 1998 (US$ thousands)

Revenue		1999	1998
Grant and contract income			
	Unrestricted	$ 9,038	$ 9,304
	Restricted	11,643	10,660
Investment income		533	311
	Total revenue	$ 21,214	$ 20,275
Expenses			
Program services	Direct research and outreach	$ 17,258	$ 16,314
	Other services	170	211
Management and general		2,508	2,027
	Total expenses	$ 19,936	$ 18,552
	Excess of revenue over expenses	$ 1,278	$ 1,723
Transfer (to) from reserves allocated for subsequent year expenditure		(712)	(1,101)
Transfer (to) from net investment in property and equipment		32	(66)
	Increase (decrease) in working capital fund	$ 598	$ 556
Operating reserves, beginning of year		2,971	2,415
Operating reserves, end of year		$ 3,569	$ 2,971

Schedule of Expenses by Type

(US$ thousands)

Expenses	1999	1998
Personnel	$ 5,868	$ 5,503
Fringe benefits	3,526	3,304
Collaboration/field expenses	4,432	3,889
Travel	1,648	1,350
Computer	76	122
External publications	382	358
Trustees' expenses (nontravel)	56	78
Office operations	3,419	3,861
Foreign exchange loss (gain)	252	(145)
Depreciation/amortization	276	231
Total	$ 19,936	$ 18,552

IFPRI BOARD OF TRUSTEES, 1999-2000

Standing (left to right): Solita C. Monsod, Godfrey Gunatilleke, I. G. Patel, Rebeca Grynspan Mayufis, G. Edward Schuh, Susan Horton, Benno Ndulu, Wenche Barth Eide, Susumu Matsuoka

Seated (left to right): Baba Dioum, Geoff Miller, Per Pinstrup-Andersen, Martin Piñeiro, Uwe Holtz, Arie Kuyvenhoven

Not pictured: Isher Judge Ahluwalia, Heba Ahmad Handoussa, Sylvia Ostry, Frances Stewart, Wen Simei

Martin Piñeiro, Chair, 1999–2000*
Director
Grupo CEO
Buenos Aires, Argentina

Geoff Miller, Chair, 2000-2001
Principal
GCM Strategic Services Pty. Ltd.
Chatswood, Australia

Susan Horton, Vice Chair, 1999-2000***
Professor of Economics
University of Toronto
Toronto, Canada

Rebeca Grynspan Mayufis, Vice Chair, 2000-2001
Former Vice President of Costa Rica
Economics Consultant
San José, Costa Rica

Isher Judge Ahluwalia**
Director and Chief Executive
Indian Council for Research on International Economic Relations
Delhi, India

Baba Dioum
Coordinator General
Conference of West and Central African Ministers of Agriculture
Dakar, Senegal

Wenche Barth Eide
Professor
Institute for Nutrition Research, School of Nutrition, University of Oslo
Oslo, Norway

Godfrey Gunatilleke*
Chairman
The Marga Institute
Sri Lanka

Heba Ahmad Handoussa***
Managing Director
Economic Research Forum for the Arab Countries, Iran, and Turkey
Cairo, Egypt

Uwe Holtz*
Professor of Political Science
University of Bonn
Bonn, Germany

Arie Kuyvenhoven
Chairman, Department of Economics and Management
Wageningen Agricultural University
Wageningen, the Netherlands

Susumu Matsuoka
CEO
Japan FAO Association
Tokyo, Japan

Solita Collas Monsod
Professor of Economics
University of the Philippines
Quezon City, the Philippines

Benno Ndulu
Lead Specialist
World Bank
Dar es Salaam, Tanzania

Sylvia Ostry**
Distinguished Research Fellow
Centre for International Studies, University of Toronto
Toronto, Canada

I. G. Patel*
Former Director
London School of Economics
Baroda, India

Per Pinstrup-Andersen
Director General, IFPRI
Ex Officio

G. Edward Schuh
Orville and Jane Freeman Professor for International Trade and Investment Policy and Regents Professor
University of Minnesota
Minneapolis, Minnesota, U.S.A.

Frances Stewart**
Professor and Director
Queen Elizabeth House, International Development Centre, Oxford University
Oxford, United Kingdom

Wen Simei**
Professor and Director
Institute of Economic Development, South China Agricultural University
Guangzhou, People's Republic of China

* **Term ended in 2000**
** **Term began in 2000**
*** **Resigned in 2000**

PERSONNEL

List reflects personnel employed by IFPRI as of December 31, 1999, and includes part-time staff members. Country indicates citizenship of staff member.

DIRECTOR GENERAL'S OFFICE

Director General
Per Pinstrup-Andersen, Denmark

Research Fellow Emeritus
Nurul Islam, Bangladesh

Head, 2020 Vision for Food, Agriculture, and the Environment
Rajul Pandya-Lorch, Kenya

Coordinator, 2020 Vision Network for East Africa
Fred Opio, Uganda (outposted to Uganda)

Coordinator, 2020 Vision Network for West Africa
Sudhir Wanmali, India (outposted to Ghana)

Special Assistants to the Director General
Stacy Roberts, U.S.A.
Marc Cohen, U.S.A.

Senior Research Assistant
Julie Babinard, France

Executive Secretary to the Director General
Edith Yalong, Philippines

Administrative Coordinator
Jenna Kryszczun, U.S.A.

Graphics Specialist
Vickie Lee, Philippines

RESEARCH AND OUTREACH

ENVIRONMENT & PRODUCTION TECHNOLOGY DIVISION

Director
Peter Hazell, United Kingdom

Research Fellow Emeritus
Peter Oram, United Kingdom

Senior Research Fellows
Shenggen Fan, China
Ruth Meinzen-Dick, U.S.A.
Philip Pardey, Australia
Mark Rosegrant, U.S.A.

Senior Scientist
Stanley Wood, United Kingdom

Research Fellows
Nabil Chaherli, Tunisia (outposted to Syria)
Junichi Ito, Japan
Nancy McCarthy, U.S.A. (outposted to Kenya)
Tidiane Ngaido, Senegal (outposted to Syria)
John Pender, U.S.A.

Postdoctoral Fellows
Ximing Cai, China
Ephraim Nkonya, Tanzania (outposted to Uganda)

Visiting Research Fellows
Barbara Craig, U.S.A.
Walter Huppert, Germany
Ruerd Ruben, Netherlands
Melinda Smale, U.S.A.

Research Analysts
Nienke Beintema, Netherlands
Connie Chan-Kang, Canada
Anna Knox, U.S.A.
Claudia Ringler, Germany
Xiaobo Zhang, China

Senior Research Assistants
Pamela Jagger, Canada
Siet Meijer, Netherlands
Patricia Zambrano, Colombia

Research Assistant
Michael Paisner, U.S.A.

Senior Administrative Coordinator
Sandra Arce, Honduras

Administrative Coordinators
Denise Dixon, U.S.A.
Beryl Hackett, United Kingdom

Senior Word Processing Specialist
Audrey Abernathy, U.S.A.

Word Processing Specialists/Program Assistants
Kathleen Flaherty, U.S.A.
Ann Gloria, Philippines

IFPRI in the Field

Research frequently takes IFPRI staff away from their offices in Washington, D.C., and into the field, but IFPRI also posted 13 staff members to developing countries as part of collaborative projects with institutions in those countries. IFPRI staff living and working in Bangladesh, Egypt, Ghana, Kenya, Malawi, Mexico, Mozambique, Syria, and Uganda were able to interact more closely with collaborators. From their posts in the field, these staff got a different view of research problems and had regular opportunities to share their skills in policy research and analysis in these developing countries.

FOOD CONSUMPTION & NUTRITION DIVISION

Director
Lawrence Haddad, United Kingdom

Senior Research Fellows
Howarth Bouis, U.S.A.
Agnes Quisumbing, Philippines

Research Fellows
Michelle Adato, U.S.A.
Akhter Ahmed, Bangladesh (outposted to Egypt)
Todd Benson, U.S.A. (outposted to Malawi)
David Coady, Ireland
Carlo del Ninno, Italy (outposted to Bangladesh)
Rafael Flores, Guatemala
James Garrett, U.S.A.
Stuart Gillespie, United Kingdom
Sudhanshu Handa, Canada (outposted to Mexico)
John Hoddinott, Canada
Carol Levin, U.S.A.
Saul Morris, United Kingdom
Marie Ruel, Canada
Kenneth Simler, U.S.A. (outposted to Mozambique)
Emmanuel Skoufias, Greece
Lisa Smith, U.S.A.

Postdoctoral Fellows
Sumiter Broca, India (outposted to Malawi)
Benjamin Davis, U.S.A. (outposted to Mexico)
Kelly Hallman, U.S.A.
John Maluccio, U.S.A.
Manohar Sharma, Nepal

Visiting Research Fellows
Calogero Carletto, Italy
Aliou Diagne, Senegal
Tammi Gutner, U.S.A.

Communications Specialist
Bonnie McClafferty, U.S.A.

Research Analysts
Lyla Kuriyan, U.S.A.
Ellen Payongayong, Philippines
Yisehac Yohannes, Ethiopia

Senior Research Assistants
Sanjukta Mukherjee, India
Oscar Neidecker-Gonzales, Honduras
Prem Sangraula, Nepal
Ryan Washburn, U.S.A.

Senior Administrative Coordinator
Lynette Aspillera, Philippines

Administrative Coordinators
Lourdes Hinayon, Philippines
Marie Hoffman, U.S.A.
Ginette Mignot, Canada

Senior Word Processing Specialist
Jay Willis, U.S.A.

Word Processing Specialists/Program Assistants
Cristina Abad-Quintos, Philippines
Marinella Yadao, Philippines

Program Assistant
Corinne de Gracia, France

MARKETS & STRUCTURAL STUDIES DIVISION

Director
Raisuddin Ahmed, Bangladesh

Senior Research Fellows
Christopher Delgado, U.S.A.
Paul Dorosh, U.S.A. (outposted to Bangladesh)
Francesco Goletti, Italy

Research Fellows
Mylène Kherallah, Lebanon
Nicholas Minot, U.S.A.

Visiting Research Fellow
Ousmane Badiane, Senegal

Postdoctoral Fellows
Eleni Gabre-Madhin, Ethiopia
Shahidur Rashid, Bangladesh

Program Analyst
Emma Samman, U.S.A.

Research Analysts
Philippe Berry, France
Claude Courbois, U.S.A.
Peter Gruhn, Canada
Meyra Mendoza, Philippines

Senior Administrative Coordinator
Elizabeth Daines, U.S.A.

1999 Awards to IFPRI Staff

Nabil Chaherli *was selected as a research associate of the Cairo-based Economic Research Forum (ERF). The category of research associate to the ERF was created to provide incentives for promising scholars of the region.*

Marc Cohen *was selected for inclusion in the Millennium Edition of Who's Who in America.*

Eleni Gabre-Madhin *was awarded the Outstanding Dissertation Award by the American Agricultural Economics Association for her dissertation "Transaction Costs, Contractual Choices, and Institutions in the Ethiopian Grain Market," at Stanford University.*

Peter Hazell *was selected for inclusion in Who's Who in Economics, 3rd edition, published in 1999. He was also included in two earlier editions.*

Per Pinstrup-Andersen *received an Honorary Doctorate of Laws from the University of Aberdeen in the United Kingdom and an Honorary Doctorate from India's Tamil Nadu Veterinary and Animal Sciences University. He was also named an Honorary Professor of Economics by Tashkent State Agrarian University in Uzbekistan.*

Xiaobo Zhang *was awarded the graduate travel grant award from the Graduate School at Cornell University. He also earned the Outstanding M.S. Thesis Award from the Northeastern Agricultural Economics Association and the Award of Merit for Outstanding M.S. Thesis in the Graduate Field of Agricultural Economics 1998–1999 from Cornell University.*

Word Processing Specialists/Program Assistants
Diana Flores, Guatemala
Carletta Todd, U.S.A.

TRADE & MACROECONOMICS DIVISION

Director
Sherman Robinson, U.S.A.

Senior Research Fellow
Romeo Bautista, Philippines

Research Fellows
Eugenio Díaz-Bonilla, Argentina
Hans Löfgren, Sweden

Visiting Research Fellows
Antonio Gómez-Merlano, Colombia
Samuel Morley, U.S.A.
Lucio Reca, Argentina
Susan Schadler, U.S.A.

Research Analysts
Andrea Cattaneo, U.S.A.
Moataz El-Said, Egypt
Rebecca Harris, U.S.A.
Valeria Piñeiro, Argentina
Anne-Sophie Robilliard, France
Marcelle Thomas, U.S.A.
Peter Wobst, Germany

Senior Administrative Coordinator
María Cohan, Argentina

Word Processing Specialist/Program Assistant
Florence Meria, U.S.A.

VISITING RESEARCHERS

Some 130 visitors spent time at IFPRI in 1999. Those listed here spent about a month or more at IFPRI.

Albert Acquaye, University of California, Davis, U.S.A.
Margaret Armar-Klemesu, Noguchi Memorial Institute for Medical Research, Ghana
Channing Arndt, Purdue University, U.S.A.
Philippe Chabot
Ujjayant Chakravorty, Emory University, U.S.A.
Mohamed Chemingui, University of Montpellier, France
Heidi Cloots, American University, U.S.A.
Habiba Djebbari, University of Maryland, U.S.A.
Marzia Fontana, Institute of Development Studies, University of Sussex, United Kingdom
Nazmul Hassan, Institute for Nutrition and Food Science, University of Dhaka, Bangladesh
Ulrich Hausner, University of Kiel, Germany
Dubravka Mindek Jagic, PROGRESA, Mexico
Bereket Kebede, Addis Ababa University, Ethiopia
Jan Low, Michigan State University, U.S.A.
Karen Macours, University of California, Berkeley, U.S.A.
Purnima Menon, Cornell University, U.S.A.
Chantal Nielsen, Danish Institute of Agricultural and Fisheries Economics and the University of Copenhagen, Denmark
Gabrielle Persley, World Bank
Karl Rich
James Ryan
Ebbe Schiøler, DANIDA, Denmark
Ben Senauer, University of Minnesota

The best part of working as an outposted staff person is having the opportunity to affect policy and institutional capacity. I've appreciated working for an institution with a reputation for good analysis, as well as good interpersonal relationships, in Bangladesh. The past work of other IFPRI researchers has provided a solid base on which to build our research and policy analysis. And continued support from researchers with long years of experience in Bangladesh has been invaluable.

—Paul Dorosh, senior research fellow, outposted in Dhaka, Bangladesh

When I was a young boy my mother often told me that there were children dying of hunger in the world. I discarded that statement for most of my formative years, and then there was a breaking point. It happened when I started traveling to places like Bangladesh, where I saw children sifting through the dust to find enough to eat. I realized that if I wanted to do something good in my life, I should use my capacities to help poor people get food.

—Francesco Goletti, senior research fellow

I appreciate the atmosphere here at IFPRI and especially in the Human Resources department where I work. It is not often that we are presented with the opportunity to share so much. I am fortunate to work with people who are not just names and faces but real friends.

—Alexis Howard, human resources assistant

I earned a BA in fine arts but also studied several computer programming languages. I've been at IFPRI for almost 12 years, starting in Computer Services. In 1997 IFPRI decided it was time to start a website. I was thrilled to have the opportunity to take on the website, which combined my computer and graphic art skills. IFPRI has always provided me with a challenge and a chance to learn new technologies and apply them to my work.

—Mary Mastroianni, website developer

I work on a project helping the government of Guatemala strengthen its community-based day care centers in urban slums. These centers help poor urban women work so they can earn money to buy food for their families. If we want people to participate in the program, we have to show that it helps the poor and that the children are well taken care of. There is never a dull moment around IFPRI. Our multidisciplinary work is part of the challenge, and I actually enjoy our disagreements, because they force us to be clearer with each other and with those who can benefit from our work.

—Marie Ruel, research fellow

I work on public investment issues in rural China and India, especially the effects of investments in things like roads, schooling, health, and irrigation in different parts of the country. We try to evaluate how these investments affect poverty and productivity to help governments determine the best mix of strategies. I think the work is really important, especially for the rural poor. We're really on the frontier of research in areas concerning food policy, and that's very exciting!

—Xiaobo Zhang, research analyst

People are afraid of globalization: for some it brings up images of dark forces that will control or adversely affect their lives. One of our projects is to analyze the dimensions of globalization. The hope is that by better defining globalization we can draw policy implications that will help alleviate poverty, improve food security, and help the environment. Doing research at a place like IFPRI helps you get at the basic facts about the issues you're working on—the facts that you never have time to fully collect and analyze when you're designing and implementing policies.

—Eugenio Diaz-Bonilla, research fellow

Not only do I strongly believe in IFPRI's mandate and its continuous effort to alleviate hunger and poverty around the world, but I also have high admiration for the dedication and passion of the people working toward achieving this goal. What a great goal to work for—I am proud to be able to play even a small part in it.

—Edith Yalong, executive secretary to the director general

I coordinate the CGIAR systemwide program on collective action and property rights (CAPRi). We research how and whether agricultural technologies will be used and by whom. For example, integrated pest management will only work well if a lot of the farmers in a region adopt it—that's collective action. At IFPRI we get to deal with really important issues—translating research into discussions with policymakers and others who can make a difference.

—Ruth Meinzen-Dick, senior research fellow

COMMUNICATIONS DIVISION

Director
Klaus von Grebmer, Switzerland

Information Program

Head
Don Lippincott, U.S.A.

Senior Editors
Heidi Fritschel, U.S.A.
Phyllis Skillman, U.S.A.

Communications Specialist
David Gately, U.S.A.

Desktop Publishing Specialists
Evelyn Banda, U.S.A.
Lucy McCoy, U.S.A.

Website Developer
Mary Mastroianni, U.S.A.

Senior Administrative Coordinator
Beverly Abreu, U.S.A.

Program Assistant
Valaida Ebb, U.S.A.

Information Clerk
Marie Aspillera, Philippines

Head Librarian
Patricia Klosky, U.S.A.

Librarian
Thomas Mann, U.S.A.

Library Clerical Assistant
June Sullivan, U.S.A.

Policy Seminars Program

Head
Laurie Goldberg, U.S.A.

Meetings/Conference Coordinator
Simone Lee, U.S.A.

Training and Capacity-Strengthening Program

Head and Research Fellow
Suresh Babu, India

Senior Research Assistant
Will Reidhead, U.S.A.

SUPPORT

FINANCE & ADMINISTRATION

Director
Martin Van Weerdenburg, Australia

Senior Administrative Coordinator
Bernadette Cordero, Philippines

ADMINISTRATIVE SERVICES

Travel Coordinator
Luisa Gaskell, Philippines

Head, Facilities
Anthony Thomas, U.S.A.

Photocopy/Facilities Assistant
Glen Briscoe, U.S.A.

Receptionist
Yolanda Palis, Philippines

Facilities Assistant
Melvin Suggs, U.S.A.

COMPUTER SERVICES

Head
Nancy Walczak, U.S.A.

Senior Information Technology Professional
Luan Nguyen, U.S.A.

Information Technology Professionals
Kang Chiu, China
Yin Leong, Malaysia

Microcomputer Support Technician
Aamir Qureshi, Pakistan

FINANCE

Controller
Thuan Huynh, U.S.A.

Chief Accountant
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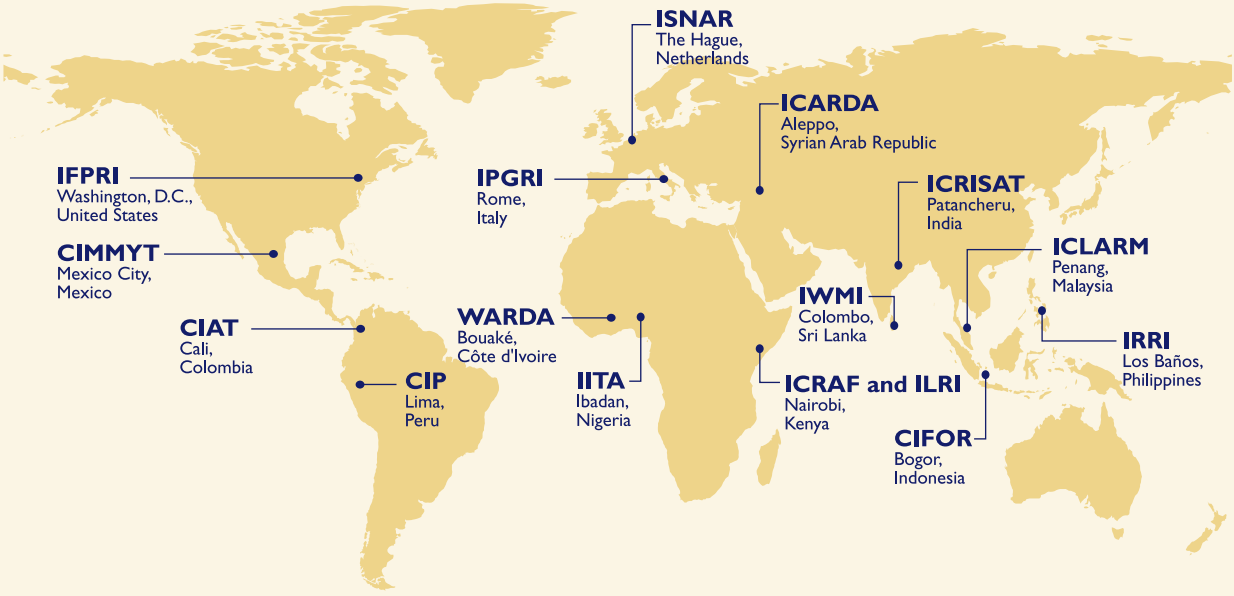
IFPRI is one of 16 food and environmental research organizations known as the Future Harvest centers. The centers, located around the world, conduct research in partnership with farmers, scientists, and policymakers to help alleviate poverty and increase food security while protecting the natural resource base. They are principally funded 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 designed 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 policymakers and civil society, and it enlists world-renowned leaders to speak on its behalf. Future Harvest supports research, promotes partnerships, and sponsors on-the-ground projects that bring the results of research efforts to farmers' fields in Africa, Asia, and Latin America. For more information on Future Harvest, go to www.futureharvest.org.



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CIAT—Centro Internacional de Agricultura Tropical

CIFOR—Center for International Forestry Research

CIMMYT—Centro Internacional de Mejoramiento de Maíz y Trigo

CIP—Centro Internacional de la Papa

ICARDA—International Center for Agricultural Research in the Dry Areas

ICLARM—International Center for Living Aquatic Resources Management

ICRAF—International Centre for Research in Agroforestry

ICRISAT—International Crops Research Institute for the Semi-Arid Tropics

IFPRI—International Food Policy Research Institute

IITA—International Institute of Tropical Agriculture

ILRI—International Livestock Research Institute

IPGRI—International Plant Genetic Resources Institute

IRRI—International Rice Research Institute

ISNAR—International Service for National Agricultural Research

IWMI—International Water Management Institute

WARDA—West Africa Rice Development Association

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