



INTERNATIONAL FOOD  
POLICY RESEARCH INSTITUTE  
*sustainable solutions for ending hunger and poverty*

A large, faint silhouette of a South Asian monument, possibly the Gateway to India in Mumbai, is centered in the background. The monument features a prominent dome and a star-shaped archway. The entire background is a solid light yellow color.

# South Asia

## Agricultural and Rural Development

PROCEEDINGS OF SEMINARS • MARCH 2005

New Delhi • Lahore • Chennai • Dhaka

# About IFPRI

The International Food Policy Research Institute (IFPRI) was established in 1975 to provide sustainable solutions for ending hunger and poverty. IFPRI is one of 15 agricultural research centers that receives its principal funding from governments, private foundations, and international and regional organizations, most of which are members of the Consultative Group on International Agricultural Research ([www.cgiar.org](http://www.cgiar.org))

To help achieve IFPRI's mission in South Asia, an office was opened in New Delhi in March 2005.

# Contents

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Foreword	1
Inauguration of IFPRI's South Asia Office	3
Indian Agriculture and Rural Development <i>Strategic Issues and Reform Options</i>	11
Agriculture in South Asia <i>Destined for a New Deal</i>	19
South Asia Seminar Proceeding Briefs	
New Delhi, India	23
Lahore, Pakistan	27
Chennai, India	31
Dhaka, Bangladesh	35
IFPRI's South Asia Initiative (box)	40



# Foreword

IFPRI has had a long presence in South Asia, identifying ways to eliminate the deep-seated poverty in the region, exploring the impact of the Green Revolution, and undertaking major work on subsidies, trade, markets, nutrition, adoption of agricultural technology, and other issues critical for the region. Over the last few years, IFPRI has intensified its activities in South Asia, given the persistence of poverty in the region and the new opportunities and challenges it faces.

This renewed commitment is exemplified by IFPRI's South Asia Initiative (an effort to bring together IFPRI staff and researchers and policymakers from the region in a more focused way) and by its South Asia office, opened in New Delhi this past March.

IFPRI was honored to have Indian Prime Minister Manmohan Singh inaugurate the New Delhi office. In conjunction with the inauguration, a technical seminar was co-organized by our Indian partners the Confederation of Indian Industry and the National Council of Applied Economic Research. After the seminars, the Board of Trustees held their annual meeting in New Delhi and Rajasthan. And following the Board meeting, country seminars were held in Bangladesh (with the Bangladesh Institute of Development Studies and Bangladesh Rice Foundation), in India (with the M.S. Swaminathan Research Foundation and XV Genetic Congress Trust), and in Pakistan (with Beaconhouse National University).

This booklet provides an overview of these exciting events along with some supplementary material on IFPRI's activities and strategies in the region.

I especially want to thank the chair of the IFPRI Board of Trustees, Isher Judge Ahluwalia, for her guidance and support regarding the inaugural activities and IFPRI's growing presence in South Asia, and Sartaj Aziz, M. S. Swaminathan, and M. Syeduzzaman for their leadership in the successful seminars in Pakistan, India, and Bangladesh, respectively.

IFPRI looks forward to a sustained and fruitful cooperation in South Asia, working alongside national, regional, and international partners to help the region achieve its enormous potential for economic growth, rural development, and improved food and nutrition security of the poor.

Joachim von Braun  
Director General, IFPRI



# Inauguration of IFPRI's South Asia Office

*Speeches made in New Delhi after Prime Minister Manmohan Singh inaugurated IFPRI's South Asia office*



## *Emerging Global Issues and the Role of IFPRI* *Joachim von Braun, Director General, IFPRI*

Your Excellency, the Prime Minister of India, Dr. Manmohan Singh; Madame Chairperson, Dr. Isher Judge Ahluwalia; distinguished members of the IFPRI Board of Trustees, Excellencies, and distinguished guests from India and around the world: Thank you so much for joining IFPRI this morning for the inauguration of our New Delhi office. IFPRI is honored by your presence. I also thank the government of India, especially the Indian Council of Agriculture Research (ICAR), for hosting us in this complex. Mr. Prime Minister, we truly appreciate your taking the time to join us despite your busy schedule.

I also thank my IFPRI staff in Washington and New Delhi, especially Dr. Ashok Gulati, for their efforts in setting up this office. This will not be simply an office but a vibrant research branch of IFPRI.

Since IFPRI's inception thirty years ago, India and the larger South Asia region have been a focal point of our research. The alliance of the Centers of the CGIAR, of which IFPRI is part, along with national agricultural research organizations, played a key role in promoting the Green Revolution in the late 1960s and 1970s. More recently, IFPRI has conducted research, undertaken capacity-strengthening activities, and facilitated policy dialogues in the region in collaboration with ICAR and other members of the IFPRI-facilitated South Asia Initiative. South Asia, and India in particular, will remain a key component of IFPRI's forward-looking agenda for many years to come. And from now on, our commitment to the region will be solidified by our presence here, in close proximity to our partners and colleagues. Besides welcoming you all here to this wonderful new office, I would like to make a few remarks about the context in which IFPRI is opening this facility. This context shapes the issues that we hope to study from this important new hub.

As Mahatma Gandhi said: *"There are seven sins in the world: wealth without work, pleasure without conscience, knowledge without character, commerce without morality, science without humanity, worship without sacrifice, and politics without principle."*

I can assure you that IFPRI incorporates character into knowledge, humanity into science, and principle into

politics. IFPRI policy research and communication is oriented toward the needs of poor farmers and consumers. Better policy can have a tremendous poverty-reducing impact. Yet policy advice is worthless without the political will and commitment of the national leaders. That is why the support and dedication of the Indian government for our work in this country and throughout the region is particularly valuable.

## **Millennium Development Goals**

As you know, the international community has agreed to work together to reduce hunger and poverty by half no later than 2015. But the world is not on track to meet these milestones. If current trends continue, there will still be about 600 million hungry people in 2015, far short of the target of 400 million. Declines in poverty have also been minimal in the past decade—the number of people in the world who live on less than US\$1 a day has fallen by only 12 million since 1990. With business as usual, almost a billion people will still live in absolute poverty by 2015. The Millennium Development Goals (MDGs) will not be achieved without a fundamental development paradigm shift.

South Asia is the region of the world with the highest concentration of poverty. Although South Asia is expected to reduce the incidence of poverty substantially by 2015, progress must be accelerated. This will require shaping policy not only to promote economic growth but also to improve distribution. To achieve more equitable growth,

policies to generate employment opportunities, for example, must be accompanied by strengthened and better-targeted safety nets for the vulnerable segments of the population.

IFPRI wants to contribute to the efforts of national governments in the region by lending its expertise both in formulating individual policy interventions and in shaping comprehensive strategies for pro-poor growth. Our long-standing research on the issue of targeted safety nets, for instance, has earned IFPRI recognition in policy circles. Also, over the past two years, IFPRI has played a key role in contributing to the Hunger Task Force Report for the UN Millennium Project that put forth policy recommendations for achieving the MDGs on hunger.

## Untapped Market Opportunities

Trade liberalization has the potential to offer tremendous opportunities for South Asia by opening up lucrative new markets, generating foreign exchange, and stimulating the agricultural sector that provides the majority of the world's poor people with their livelihoods. Regrettably, however, international markets remain heavily protected, and developed countries' domestic producers are heavily subsidized. Reducing poverty cannot be accomplished until we ensure fair trade between developing and industrialized nations.

To capitalize on the promise of trade liberalization, the developing countries need to create a strong and unified alliance to prevail in the upcoming multilateral trade negotiations. India is playing an important role in building such a coalition of developing countries and tilting the power dynamics in their favor through its strong role in the G-20. A growing role in global forums such as the WTO is a part of global responsibility that comes with India's size and position in the world. The time has come to shift away from merely coping with the impacts of globalization to actually shaping globalization into a process that is beneficial for the world's poor. Only then will the Doha round of WTO negotiations truly be a "development round." IFPRI is committed to supporting South Asian countries in their aspiration to shape the appropriate agenda for action rather than responding to the one set by the rich nations.

## Public Investment, Institutions, and Governance

Increasing public investment in agricultural research and development, infrastructure, health, and education is critical to improving the standard of living for South Asia's poor. The effectiveness of these investments, however, is closely linked to the quality of institutions that accompany them. Currently, there is ample room to strengthen public institutions and governance in most developing countries. The crippling effects of corruption and poor capacity continue to undermine already scarce public resources and hinder efforts to address poverty and hunger throughout the world.

Thus, promoting transparency and accountability, competent public administration, and the rule of law must be at the forefront of development policies. Not only will better governance allow public investments to be more productive, but it will also help optimize their allocation by giving voice to poor people and engaging them in public policy processes. Given its mission to provide developing countries with sustainable policy solutions to end hunger and poverty, IFPRI does not overlook the central role of governance and institutions. Much of our research has revolved around these issues and will continue to do so in the years to come.

We welcome the opportunity to work even more closely with our partners in the region on research that can generate appropriate policy solutions. Cooperation with universities is an important element of that. Because we are engaged in policy research, IFPRI is particularly pleased to open this office in India. India's long-standing tradition of democratic institutions and open debates provides a congenial environment for the pursuit of our common goals and for expanding our activities in South Asia. What we learn here will also be invaluable to our operations in other parts of Asia, as well as in Africa and Latin America. We believe that mutual sharing and learning go a long way toward promoting meaningful globalization. Ultimately, as the Sanskrit saying states, "Vasudhaiva Kutumbakam" ("the entire universe is one family"), and we must all work together for the common good. Again, I welcome you to the IFPRI New Delhi office and thank all of the distinguished guests, especially his Excellency, the Prime Minister, for joining us today.



## *The Role of IFPRI in South Asia*

*Ashok Gulati, Director, Markets, Trade, and Institutions Division, IFPRI*

Honorable Prime Minister of India, Dr. Manmohan Singh; Madame Chairperson, Dr. Isher Judge Ahluwalia; Dr. Joachim von Braun; and distinguished guests and colleagues. We are honored to have you here at the launch of our New Delhi office. Let me say a few words about why we are launching this office in South Asia and what we are planning to achieve through this office.

As most of you know, South Asia is often referred to as a success story because of its experience with the Green Revolution, which made a significant dent in poverty. But the region still faces a challenge. South Asia is still home to about 40 percent of the world's poor people (those who live on less than US\$1 a day). It supports roughly 22 percent of the world population but generates less than 2 percent of global income. It has the world's highest concentration of poverty.

IFPRI's mission is to look for sustainable solutions to ending hunger and poverty, so we have long been working in this part of the world. But in 2002, IFPRI launched a new program called the South Asia Initiative (SAI). The idea was to capitalize on past experience and to build synergy across the countries of South Asia. SAI formed a network of policy analysts and advisers from South Asia named PAANSA. We were privileged to have luminaries like you, Mr. Prime Minister, from India; Mr. Sartaj Aziz from Pakistan; and Mr. M. Syeduzzaman from Bangladesh guiding us as members of this network.

PAANSA prioritized the issues requiring research and capacity strengthening in this region, of which the two most noteworthy are (1) the impact of trade liberalization on food security and (2) diversification toward high-value agriculture and the implications for smallholders. Another experiment launched in the region was known as "The Dragon and the Elephant"—a comparative study of reforms in China and India, with a focus on agriculture. These exciting studies have allowed us to realize synergies not only between researchers in Washington and researchers in South Asia, but also among researchers across the region. As Dr. von Braun mentioned, the goal of mutual sharing and learning was being translated into reality.

Since 2002 SAI has expanded greatly, thanks to our collaborators and donors. We are honored by the association of senior policy advisers, researchers, and agribusiness and farmer leaders from the region, who have guided and supported this venture. IFPRI's role in facilitating policy research and bringing the wise together has indeed paid off.

Sometimes such interactions have spontaneous and unexpected spillover effects that go beyond pure research and policy pursuits and are perhaps more valuable in

terms of human relationships. Like the birds and the rivers, researchers know no borders. For example, in a recent training workshop in Pakistan, organized by IFPRI in association with the University of Faisalabad and Innovative Development Strategies, Dr. Qureshi and Dr. Sohail Malik organized a visit to village Gah in district Chakwal, in Pakistan Punjab—your native village, Mr. Prime Minister. We were mesmerized by the reception we received from the villagers, who welcomed us with flower petals and danced with joy to display the honor of seeing a little boy from their village become the prime minister of India. With tearful eyes, they conveyed their pride in you as a prime minister who is admired on both sides of the border. We were also taken to the primary school, where you studied, and shown the mark sheets when you got first rank in grade IV. We met one of your classmates, Mohammad Ali, who fondly remembered you and wished to see you in the near future.

The spontaneous love and affection of the people spoke volumes about the unexploited social capital in the region. Let us not underestimate the importance of people-to-people contact for building lasting economic and political relationships. The movement of people, goods, and services can help develop a common market on a pattern similar to that in Europe, which will benefit everyone in the region. IFPRI's endeavor is to capture some of such lessons and opportunities through its New Delhi office. Once again, I am grateful to all of you for the honor you have bestowed upon us by coming to this inaugural function. I also take this opportunity to extend my heartfelt thanks to my colleagues at IFPRI, especially Dr. PK Joshi, and the architect and the designer, for their valuable contribution to this New Delhi office.



## *Inaugural Address*

### *His Excellency, Manmohan Singh, Prime Minister of India*

I do not claim to have any expert knowledge of the subjects of this area. IFPRI has been engaged in research for the last 30 years. But public office, I regard, is private education at public expense. Therefore, my long association with public life has given me some insights, which I thought I would use this opportunity to share with you. Every morning I receive a large number of telephone calls. I received three telephone calls this morning, which I think sum up the top priorities that we in this country, and I hope it's true of South Asia as a whole, face in our quest for a life of dignity and self-respect for our people. One child asked me this morning, "What are you doing to save our tigers?" India needs a strategy of development that is economically efficient and environmentally sustainable. The second telephone call came from a young man who said, "What about employment?" Employment is a vital issue today, and everywhere I go, I am asked these questions from young men and women, "What about employment? What are we going to do to provide gainful employment to our people?" The third telephone call I received in the morning was with regard to biosafety. We have the immense possibility of biotechnology, both in areas of health and in areas of agricultural development—a new beginning can be made, but there are also risks, there are question marks. There are worries about the side effects of the new biotechnologies, and I suggest to you that these three concerns are concerns that are widely shared in South Asia. And I sincerely hope that in the days, months, and years to come, IFPRI's efforts can be brought to throw light on these formidable challenges that all countries in South Asia face in their quest of democratic and more just social and economic development.

I am absolutely delighted to be here today to inaugurate the New Delhi office of the International Food Policy Research Institute. I know of the excellent work that IFPRI has done in the last 30 years, and I sincerely hope that the next 30 years will be far more productive and far more effective in the quest of building a world order where hunger, malnutrition, and poverty will be a thing of the past.

I am very happy to note that this office of IFPRI will be the hub of IFPRI's research and capacity-strengthening activities in South Asia, Southeast Asia, and Central Asia. I wish you well in this endeavor. Professor Gulati referred to the immense possibilities of mutual cooperation in South Asia and that is a well-known fact. So far we have not been able to utilize that vast latent potential of our region, and I sincerely hope that the future would indeed be different from the past. We in our country, and our government in particular, are very sincere that together with our neighbors we should make a new beginning to deploy the enormous opportunities of converting people-to-people contact and exploiting the opportunities of economic and social cooperation that exist between the countries of South Asia. And I am particularly happy to see my esteemed friend Sartaj Aziz in the audience, with whom I have shared ideas about promotion of the regional development for many years. And it is my regret that we have not been able to live up to the promise that undoubtedly exists in this vast area of promoting cooperation between the countries of South Asia.

Both IFPRI and the Consultative Group on International Agricultural Research (CGIAR) have been extremely valuable associates in our effort to strengthen our food economy and the livelihood of our farmers. I share

Dr. Joachim von Braun's vision of encouraging a deeper and closer collaboration between IFPRI and its partners in this region, with a view to augmenting farm incomes and alleviating poverty.

International organizations like IFPRI must strike roots in the regions where they work, enabling a two-way interaction between the researchers and users of their research. There is also a need to work closely with the local researchers and collaborate with local institutions. India has fortunately built up a rich tradition of policy research, and there is a considerable diversity of institutions engaged in policies. I do hope IFPRI will work in this direction by interacting closely with these institutions and draw on local knowledge and expertise in its work.

I believe your research should also be sensitive to local needs and aspirations. Our government has been voted to power on the wave of agrarian distress, caused partly by the failure of the market and partly by the failure of the state. We have committed ourselves to build a "New Deal" for rural India. What does this New Deal entail? It is intended to reverse the decline in the investment in agriculture. Professor von Braun referred to stepping up of investment in agriculture, including agricultural research. That happens to be one of our key priorities.

We need to set up the credit inflow to farmers; to increase public investment in irrigation and wasteland development; to increase funds for agricultural research and extension, to create a single market for agricultural produce; and to increase investment in rural health care, education, rural electrification, rural roads and commodities, and future markets. An important dimension of this New Deal is aimed

at launching a second Green Revolution, which will ensure food and nutrition security of the people, while at the same time augmenting farm incomes and employment. Our government will be launching a National Horticulture Mission that is aimed, in part, at stimulating this Second Green Revolution in a range of new crops and commodities.

And here I would like to list some problems that we face. The first Green Revolution was not the by-product of the work in the public sector. It has always been recognized that research in agriculture-related subjects is largely extragencies. That is why national governments spend a particular amount on agricultural research. The CGIAR came into existence in recognition of this extra baggage that goes with agricultural research. But in the last 10 or 15 years, with the growing privatization of science and technology levels, it is a fact that more advances in science and technology in areas like biotechnology are coming not from the public sector for sure, but from the private sector in research and development initiatives. The challenge is how to encourage this creativity, this innovativeness, and at the same time to ensure that new products and new processes will be far affordable for the vast majority of farmers who live on the edges of subsistence. I think this is yet another matter on which I hope IFPRI will concentrate its attention.

Even as we widen the scope of our policy concerns with respect to the agrarian economy, we must not forget that there remain the enduring challenges of our food economy that continue to demand our attention. It has been noted, for instance, that foodgrains demand has been decelerating in India in recent years, despite stability in food prices and persistence of low nutritional standards among the poor. What is puzzling is the fact that statistical evidence does not point to a deterioration in the health indicators. Rather, there is an improvement in human development indicators pertaining to the health status of the people. How do we explain this puzzle?

There is the other puzzle that the consumption of more expensive cereals has gone up, even among poorer households, while the demand for so-called inferior cereals has stagnated. What are the health and nutritional implications of this food preference in the long run? We need a better monitoring of food availability and food access situation in the country and in South Asia as a whole. We also need to understand what exactly are the food and nutrition security challenges in different parts of the country as vast, diverse, and complex as India is. I am told the Planning Commission is considering setting up a Food and Nutrition Security Watch to function as a think tank on food and nutrition security issues as well as a program reviewing agency. I hope this will help to advance our understanding of the underlying causes of malnutrition and also outline the strategies on how to deal with it.

In many ways the challenge of dealing with food and nutrition security is the responsibility, in our federal system, of the state governments. However, the central government cannot remain indifferent to the needs of people.

The Center is actively engaged in supporting schemes and programs for promoting agricultural production. It is also funding programs aimed at enhancing the food security of the people, including the National Food-for-Work Program. There are targeted programs for children, for pregnant and nursing mothers, and for weaker sections of society. Our government has strengthened the Mid-Day Meal scheme and the Antyodaya Anna Yojana. All told, we are devoting as much as Rs 40,000 crore to these social programs.

The real challenge, however, is one of implementation and of delivery of services. Our government would like to emphasize outcomes and not merely focus on outlays. The effectiveness of spending must improve both in terms of administrative efficiency and of the impact on target groups. We cannot allow a situation to persist in this country where food surpluses and accumulating food stocks coexist with starvation deaths and persistent malnutrition. The real challenge here is one of delivery and of reforming administrative systems. India can banish hunger and malnutrition. It is entirely doable. I hope our political and administrative leaderships at all levels will rise to this challenge. It is such preparation that can play a very important role in sharpening the scope of awareness of the challenges that lie ahead and the instrumentalities that can be effectively used to deal with those challenges. There is much that local governments can do to address this challenge. They must be more actively engaged in monitoring both availability and access to food at the local level and play an active role in improving the food security of the people. Our government is strongly committed to empowering the Panchayat Raj institutions and NGOs in meeting this challenge at the grassroots.

The question of food and livelihood security at the local and national levels has acquired a new global dimension with the increasing liberalization of trade in agriculture and the globalization of both research and marketing of inputs. National boundaries do not matter any longer. How can national and local governments deal with the challenge of food and nutrition security in a globalized market? What are the challenges globalization poses to the food security of a people? What can we do to make globalization a truly win-win game? There are both opportunities as well as risks. How can working together with international agencies devise mechanisms of social safety nets so that these risks can be prevented? This ultimately is also an important agenda for research in the years to come.

In what way will globalization and the liberalization of trade impinge upon our traditional knowledge? It is easy to talk about the rationality of open markets, but one must also be alive to the rationality of social practices. Agriculture is not just a business in our country—for millions of Indians, it still remains a way of life. How can we preserve this cherished way of life of so many, and yet be part of the emerging processes of globalization?

Such are the challenges that policymakers face, and researchers must be alive to them. The economist's assump-

tion of *ceteris paribus* is not a luxury available to politicians. In the real world, other things are rarely, if ever, equal as we push for change.

There is today a new challenge that governments have to deal with in formulating policy with regard to the food economy. This is the emergence of the private sector, both in research and in infrastructure. Our erstwhile model of fully publicly funded research and development in agriculture and largely publicly funded investment in rural infrastructure is being replaced by increasing private participation. Private investment in biotechnology; in developing and marketing seeds; in power, irrigation, and other rural infrastructure; and in agricultural research is increasing. How do we promote greater public-private partnership in the context of managing the creative evolution

that I talked about? How do we create a stake for the private sector in the welfare of the marginalized? How do we serve public interest while creating incentives for private investment? These are challenges for policymakers in agriculture.

I hope IFPRI will catalyze a new wave of research in India and South Asia. South Asia remains far behind its potential, both in terms of human development and in terms of agricultural and industrial production. I sincerely hope that we can all work together to improve the quality of life and the living standards of the people of South Asia. I hope IFPRI will also enable a better sharing of information and experience between South, Southeast, and Central Asia. These three regions encompass a wide range of agro-climatic regimes and can be laboratories for the world. I wish you all success in the noble task that you are engaged in.



### *IFPRI's Role in the South Asian Policy Debates*

*Isher Judge Ahluwalia, Chairperson, Board of Trustees, IFPRI*

Honorable Prime Minister Dr. Manmohan Singhji, fellow members of the IFPRI Board of Trustees, Dr. Joachim von Braun, Dr. Ashok Gulati, ladies and gentlemen. It is my privilege on behalf of IFPRI to thank the prime minister for inaugurating the New Delhi office of IFPRI. I must also thank all of you for being with us on this very special occasion. Sir, we feel specially honored that you have taken time from your very busy schedule to be with us and share your thoughts on Indian agriculture and the role that institutes like ours can play in knowledge creation, knowledge dissemination, and encouragement of debates on alternative policies and institutions.

IFPRI turns 30 this year. In the last three decades we have established many professional contacts in South Asia. We have worked with several research institutes as partners in research on agriculture and agricultural policy. We have interacted with policymakers who have helped us over the years to ask the right questions and focus our research on issues of relevance for countries in the region. More generally, whether it is the social or economic impact of the Green Revolution or the study of subsidies, whether it is the future of smallholders or the role of high-value agriculture, IFPRI researchers have contributed to the policy debate on agriculture in developing countries.

Sir, I express the sentiments of the entire CGIAR community when I state that we are very heartened by the importance assigned to agriculture in the development strategy of your government. We have heard your call for further generation of knowledge in the field of agriculture, and I assure you that our research will respond to the call. We will direct our research to addressing critical issues of policy and disseminating knowledge about best practices.

As IFPRI pursues its mission of furthering the cause of food and nutrition security in developing countries, we are very conscious of the new challenges that have emerged. I will mention only two.

The uncertain outcome of the ongoing negotiations on the World Trade Organization (WTO) Agreement on

Agriculture creates potential new vulnerabilities for developing countries and is a cause for concern. Sir, you have often drawn attention to the need for good research in this area. The conventional arguments in favor of open trade based on comparative advantage are difficult to make if industrialized countries insist on maintaining trade-distorting domestic subsidies under one guise or the other. IFPRI has joined the debate with information-based research in this area and is poised to contribute further to creating a favorable environment for trade by undertaking research on the trade-distorting impact of such subsidies.

My second example relates to the new developments in the field of biotechnology, which offers tremendous promise as well as unknown risks. Few developing countries have the institutional systems that can subject Bt crops to appropriate testing to ensure that their output characteristics are fully known and understood and, in particular, that their potential to disrupt the environment is sufficiently explored. IFPRI can generate knowledge in this area by undertaking independent evaluation of the opportunities and risks and facilitating informed policy choices.

The opening of the IFPRI office allows IFPRI to broaden and deepen its ties to South Asia with a permanent presence in the region. I would like to acknowledge the presence here today of friends from neighboring countries, including the Honorable Sartaj Aziz, who has

served Pakistan so ably as foreign minister and finance minister and who is also a longtime friend of IFPRI; and an eminent Bangladeshi policymaker, Dr. A.M.M. Shawkat Ali, another good friend of IFPRI. We hope to work with all our friends in the region to further the cause of food and nutrition security.

Let me once again thank you, Prime Minister Dr. Manmohan Singh, on behalf of one and all at IFPRI for giving us your precious time. And our very sincere thanks to all of you who have joined us on this happy occasion.



# Indian Agriculture and Rural Development

## Strategic Issues and Reform Options

*A Strategy Paper Prepared by IFPRI's Senior Management Team for Consideration by the Policymakers of the Government of India*

Joachim von Braun

Ashok Gulati

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Marie Ruel

### Recommended Actions

- Promote pro-poor rural and agricultural development by increasing investments in rural infrastructure and agricultural research and development (R&D).
- Reorient social safety nets to create more employment in rural areas; help strengthen the human resource base through education, nutrition, and empowerment of women; and build physical infrastructure.
- Reform water management and institutions and design water pricing systems on the basis of water rights to cope with increasingly scarce water supplies for agriculture.
- Exploit new opportunities to participate in the production and marketing of high-value livestock products, fruits and vegetables, and fishery.
- Work toward establishing and strengthening a rules-based multilateral trading system through World Trade Organization (WTO) negotiations and explore second-best options for bilateral or regional free trade agreements with other major developing countries.

### The Paradox and Challenges of Indian Agriculture

Indian agriculture is facing a policy paradox. Although several forecasts of the 1990s predicted that India would be a large importer of grains in the years to follow, in fact from 2001 to 2004 India exported around 30 million tons of foodgrains. It was seeking primarily to liquidate its bulging grain stocks, which reached 63 million tons in July 2002. Whereas India's agricultural policy is still rooted in the goal of self-sufficiency in grains, consumption patterns are changing fast toward high-value agricultural products such as fruits and vegetables, livestock products, and fish.

The policy environment is lagging behind the structural change occurring in India's consumption and production baskets. On another front, foreign exchange reserves, which had reached a rock-bottom US\$1.2 billion in July 1991, climbed to more than US\$120 billion by the end of 2004.

Nonetheless, despite comfortable food and foreign exchange reserves and reasonably high growth in gross domestic product (GDP) of about 6 percent annually, India still has more than 250 million underfed people (below the poverty line) and high underemployment. This situation reflects severe problems on the distribution front.

What are the reasons behind this paradoxical situation? The answer presumably lies in the neglect of, as

well as misallocation of resources in, agriculture and rural development, especially in the later phase of the reform process initiated in 1991. The average annual rate of growth in agriculture fell from more than 4 percent per year during 1992/93 to 1996/97 to less than 2 percent per year during the period 1997/98 to 2002/03, and it remains low. What led to this dramatic decline in the growth of agriculture since 1997/98? How can it be revived? How can growth in agriculture and rural development diminish poverty quickly?

To stimulate pro-poor agricultural growth and rural development, India will need to make some strategic choices. We propose action in five major areas that can help the government to accelerate agricultural growth and reduce poverty, malnutrition, and unemployment quickly and on a sustainable basis. All of these reforms can be achieved with due regard for the well-being of the country's rural poor.

### 1. Enhancing Pro-Poor Rural and Agricultural Investments and Cutting Subsidies

Since the early 1980s public investment in agriculture has experienced a secular decline, while input subsidies (on fertilizers, power, and canal irrigation) have been rising. In the early years of economic reforms, an attempt was made to arrest and reverse these trends (see Figure 1), but this effort could not be sustained. As a result the gap between investments and subsidies kept widening. Today input subsidies, together with food subsidies, amount to roughly five to six times the public investment in agriculture. With a burgeoning subsidy bill and shrinking public investment, the growth impetus for agriculture has been declining. Private

investment in agriculture has been increasing, yet it has not fully compensated for the loss from falling public investment.

The first strategic decision must be to raise the level of public investment in agriculture and in rural India. This move would also help unleash private sector investment, which complements public investment. The strategy should be to contain and target subsidies and plow the savings back into agriculture as investment.

IFPRI research shows that investments in R&D have the highest impact on agricultural growth per million rupees invested. The rates of return to public investment in research have been as high as over 60 percent, and in extension, over 50 percent. India currently invests only about 0.5 percent of its agricultural GDP in agricultural research, compared with 0.7 percent in the developing countries as a whole and as much as 2–3 percent in the developed countries. These figures suggest that government has been systematically underinvesting in a sector that offers a high social return and that there is considerable scope for diverting incremental outlays to priority areas in research.

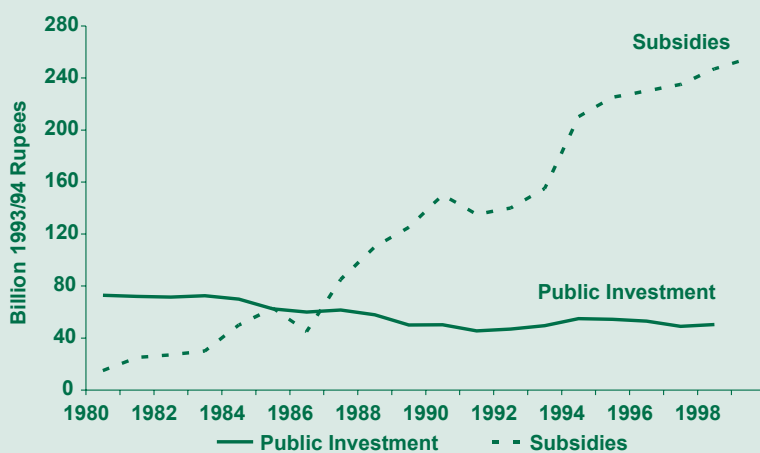
Investment in rural roads has the most potent effect on poverty alleviation, per million rupees invested, followed by investment in R&D. Across regions, the returns on each million rupees invested in the less-favored (rainfed) areas of western and southern India are now higher than in the irrigated tracts of the northwest. These rainfed areas were largely bypassed by the Green Revolution. Thus any investment in this region has a win-win potential in terms of both higher returns (efficiency) and equity.

In R&D, India had a successful record of importing high-yielding seed varieties and adapting them to local conditions during the late 1960s and 1970s, an effort that led to the Green Revolution. Although there is still ample scope for increasing rice and wheat yields, especially in the

water-abundant eastern belt, the Green Revolution has been stagnating in the northwest states of Punjab, Haryana, and western Uttar Pradesh, as well as in the southern states of Andhra Pradesh and Tamil Nadu. To keep pushing the production frontier outward, India must invest in new technologies and the institutions to accompany these technologies.

The new agricultural technologies on the horizon are largely biotechnologies. Indian policymakers, scientists, and regulators have long supported the development of biotechnology (including genetic modification) that provides new crops favorable to India's climatic areas and is suitable for use by farmers in rural communities. One of the most important technologies in the Indian context is one that produces drought resistance. Developing biotechnology appropriately, however, will require effective research

Figure 1 Public investments and input subsidies in Indian agriculture



Source: Ashok Gulati and Sudha Narayanan, *The Subsidy Syndrome in Indian Agriculture* (New Delhi: Oxford University Press, 2003).

and reforms of the regulatory structure and process, duly recognizing the local and international debate on biotechnology, particularly regarding genetically modified (GM) crops. In this context, setting up a body like the National Biotechnology Regulatory Authority (NBRA) would enhance regulation of biotechnology in India.

Investments in advanced crop technologies for Indian farmers will pay off only if there are accompanying investments in infrastructure. The connection of India's villages to information and communications technology is an important component of these initiatives. The private sector can be the key driving force, and many corporate giants have already entered rural areas with a view to expanding business. But public policy should facilitate these investments in rural areas by removing controls on private investment as well as by offering tax concessions for investing in rural areas, in order to improve poor communities' access to education, market information for farmers and other small businesses, and service information.

Investing in appropriate institutions is as important as investing in agricultural R&D and infrastructure. Institutional changes are required to ensure greater transparency and accountability in implementing agencies. India faces endemic problems stemming from poor staff incentives and a lack of financial autonomy, accountability, and transparency in its public sector agencies. The best solution is likely to be selective privatization that takes into account both equity and efficiency considerations. Public investment needs to be made more pro-poor and productive through decentralization. Community participation in constructing and maintaining rural infrastructure is crucial for the efficient operation of financial incentives and the establishment of a legal framework. The typical top-down approach followed so far in public investments will not give the desired results. Heavy participation of user groups and nongovernmental organizations (NGOs) in maintaining public infrastructure is required to turn the process of rural development from top down to bottom up.

## **2. Reforms with a Human Face: Addressing the Landless Poor**

Reforms in the agricultural sector are an important step toward increasing growth rates in the Indian economy and thus reducing poverty sustainably. But many households are not in a position to share in economic growth because of their low asset base (for example, poor nutrition, low education, and few physical assets). Studies reveal that there is typically little mobility out of extreme poverty, and many households remain poor for generations. Indeed, low human capital status and an inability to build up a minimum physical asset base play a key role in the inter-generational transmission of poverty. Any credible, broad-based development strategy must therefore involve public policies aimed directly at promoting asset accumulation by chronically poor households.

In addition, the labor productivity of the poor is currently impaired by nutrition problems, including "hidden hunger" in the form of micronutrient deficiencies. Agricultural research and production programs should focus on addressing these deficiencies through supplementation, fortification of foods (including complementary foods), and attention to making low-cost foods that are rich in micronutrients.

India is home to a wide range of social safety net programs that together attempt to address the needs of poor households at various stages of the life cycle. For households with young children, the Integrated Child Development Scheme (ICDS) provides take-home food rations linked to acquiring nutrition guidance and crucial health care. To promote higher educational attainment, the Mid-Day Meals Program provides meals to children attending school. The Public Distribution System (PDS) provides subsidized food rations to poor households through a vast network of fair-price shops. A range of community public works programs (such as Jawahar Gram Samridhi Yojana or Employment Guarantee Schemes [EGSs]) provide employment to the poor during periods of economic downturn or during the slack agricultural season. The National Old-Age Pension program and the Annapurna program provide cash to destitute elderly households without alternative family support. These programs should be transformed from social assistance to social development programs that contribute directly to the creation of physical and social assets.

Although safety net programs in India vary widely and absorb substantial public funds, their combined effectiveness is questionable. Rationed food subsidies are often poorly targeted, and corruption prevents much of the food from reaching the intended beneficiaries. For example, 53 percent of India's rural poor live in three states (Bihar, Uttar Pradesh, and Madhya Pradesh), but their dependence on subsidized food through the PDS off-take is only between 5 and 10 percent of their total cereal consumption—too little to make much difference in their food security. The costs associated with public distribution of food are also often unnecessarily high.

There is a need to rationalize wages in public works programs, walking the line between too-high wages, which will result in leakage of transfers to nonpoor households, and too-low wages, which will undermine the very objective of the programs—that is, poverty alleviation. These two considerations need to be balanced, in line with minimum wage regulation. In addition, high costs associated with managing the creation of assets through public works programs absorb scarce resources, and the resulting projects are often of low quality or never benefit the poor. The economic inefficiencies associated with financing these safety net and public works programs can also be substantial, as is the case with foodgrain support prices that distort production incentives. These different safety net programs are often poorly integrated, with some households receiving benefits from a number of sources and other poor households being completely excluded.

As a first step, existing social safety net programs in India need to be revisited to assess their targeting mechanisms, coverage, cost-effectiveness, and overall impact on poverty alleviation. Research at IFPRI, along with several studies in India, shows that programs like the EGS of Maharashtra to build rural infrastructure are more cost-effective in reaching the poor than is the untargeted PDS. These public works schemes need to be scaled up to build rural infrastructure, develop and preserve watersheds, undertake forestation, desilt canals, and so forth.

Bangladesh's Food for Education (FFE) scheme and India's own ICDS show that targeted programs have been highly successful and are worth investigating. Under the FFE scheme, the poor family of the school-aged child gets a quantity of subsidized food as long as the child attends school. This program ensures higher attendance in village schools, especially of girls, and provides food security to the poor. Such a program may be worth implementing in India on a pilot basis.

Achieving reforms for the landless poor requires developing and applying credible evaluation techniques that can then inform the design and implementation of programs. Given budget constraints and the extent of poverty in India, the country cannot afford to tackle the problem of assisting the landless poor without substantial improvements in the cost-effectiveness of the overall social safety net system. Fortunately, we have learned much from diverse experiences in several developing countries, and the wide variation in program performance across Indian states may also be a valuable source of lessons for future policy reforms.

### 3. Addressing the Water Challenge

Rapid growth in nonagricultural water demand, the unsustainable overdraft of groundwater, and a slowdown in the growth of water supply investments are leading to growing water shortages for agriculture in much of India. These shortages are likely to worsen in the coming years if business as usual continues, and the local impacts on agricultural employment and rural livelihoods could be severe. Concerted policy efforts, however, could significantly mitigate the negative effects of growing water shortages.

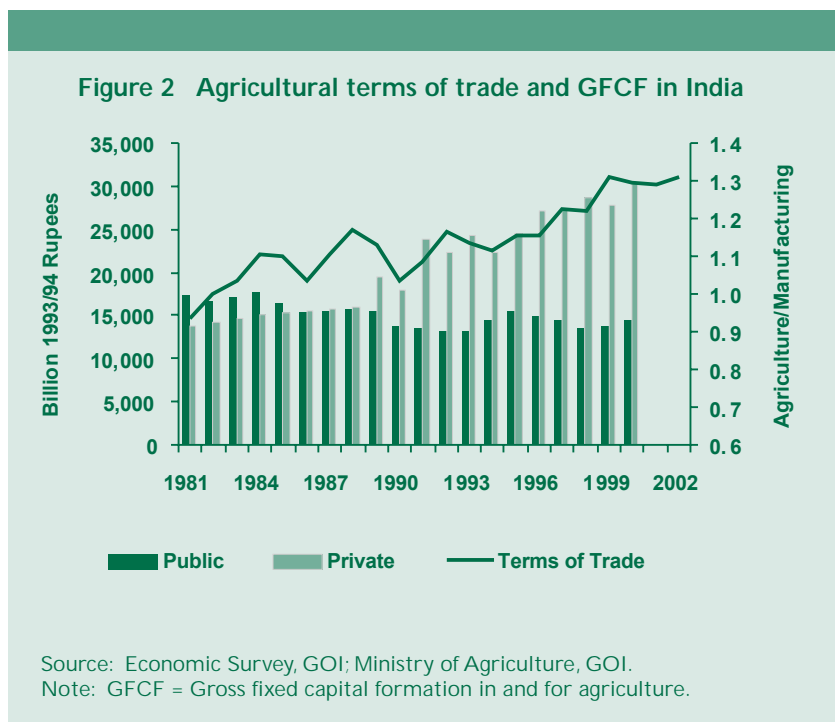
The ultimate irrigation potential of the country is roughly 140 million hectares, of which not more than 70 percent has been exploited. During the Ninth Five-Year Plan (1997–2002), irrigation grew at only about half of its target rate. Large investments would be required to complete several hundred irrigation schemes that have gone unfinished for years because of severe resource constraints. Additional resources for those projects nearing completion would

bring high returns to investments already made.

Part of the solution to water scarcity, however, lies outside of the irrigation sector. Increased investments in agricultural research could boost agricultural productivity to compensate for the diversion of water from agriculture to domestic and industrial uses. Crop research needs to target rainfed production as well as irrigated areas, taking pressure off the irrigated crops sector. In the domestic and industrial water sectors, improving both efficiency and equity through increased water prices would provide incentives for conservation, cover the costs of delivery, and generate adequate revenues to finance the needed growth in supplies and expanded coverage of clean piped water. At the same time, pressure on water transfers from agriculture would be reduced. Generalized domestic and industrial water subsidies need to be replaced with subsidies targeted to the poor.

In the irrigation sector, water policy should be designed to induce investment in improved technology and conservation of water and to encourage diversification away from irrigated cereals into crops that give more value per unit of water. It is feasible to design and implement water pricing systems on the basis of water rights that would introduce positive incentives for efficient water use and crop diversification, recover operations and maintenance (O&M) costs, and protect and even increase farm incomes.

Water rights, combined with appropriate incentives, are essential for establishing rational water allocation because they provide users with the security to invest in water-saving technology and practices. Because of the large number of small farmers in Indian irrigation systems, in most cases it is preferable to assign water rights to water user associations rather than to individual farmers. A water brokerage system with a river basin authority, or an irrigation system that brokers water trades among irrigators and



between irrigation and nonirrigation water uses, could establish incentives to use water efficiently without reducing farm incomes. A base water right would be established at major turnouts to water user associations. The user group would be responsible for internal water allocation. A fixed base charge would be applied to the initial (historical) quantity, sufficient to cover O&M and longer-term asset replacement (depreciation) costs. For demand above the base water right, a price equal to the value of water in alternative uses would be charged to users; for demand below the base right, the same price would be paid to the water user for not using the water. This system would facilitate the mutually agreed purchase and transfer of water to higher-valued uses. The promise of efficient water use and the allocation of water resources without harming the welfare of irrigators and other rural water users make the establishment of water rights, together with appropriate incentives, one of the highest priorities for water reform.

#### **4. Toward High-Value Agriculture**

Given sustained increases in per capita incomes of about 4 percent per year during the past two decades, consumption patterns in India are changing away from cereals to high-value agricultural products. How fast has the consumption basket of an average Indian changed? Data from the National Sample Survey Organisation (NSSO) show that per capita consumption of cereals from 1977 to 1999, for example, declined from 192 to 152 kilograms per year in rural areas and from 147 to 125 kilograms in urban areas. The consumption of fruits, on the other hand, increased by 553 percent, of vegetables by 167 percent, of milk and milk products by 105 percent, and of meat, eggs, and fish by 85 percent in rural areas over the same period. Similar changes occurred in urban diets. These dramatic changes indicate a structural shift in Indian diets. Add to this the new export market opportunities for many of the same products, owing to trade liberalization, and there is a happy match between the demands of the market and the need for farmers to diversify into higher-value activities. Further, high-value agricultural products have higher employment elasticity and can be suitable for smallholders, if they can participate.

In this new situation, more of the energies and resources of the agricultural sector can be unleashed to produce the kinds of high-value foods and products that are now in high demand by India's growing middle classes and urban dwellers and that have new export market opportunities. A reinvigorated agricultural and agribusiness sector could thus continue to be a major engine of income and employment growth for the country. Despite the tremendous opportunities ahead, success is not yet assured. Important challenges will need to be overcome.

The first challenge is to further shift the government's

priorities from heavy support and protection of food staples to promotion of agricultural diversification, processing, and commercialization. Simply put, most farmers are not going to get rich by growing cereals when there are already national surpluses, demand growth is slow, and world markets are glutted with the subsidized production of rich-country farmers. Farmers must shift into higher-value products to increase their incomes.

A set of public policies and investments is required to fully unleash this new potential. This set must include additional public investment in the kinds of rural infrastructure and technologies needed for these new high-value activities, improvements in marketing and distribution systems for higher-value and more perishable foods, and further liberalization of the agroindustrial sector. The private business sector can and should play a dominant role in these higher-value market chains, and public policy must strengthen the enabling environment. This change will require a fundamental shift in thinking in many public agencies that are still geared toward the dominant role that the state played in the market chains for food staples during the Green Revolution era.

Although some of the funding for these new investments will come from the private sector, new public investments are also needed. The needed funds might be obtained by reducing some of the huge subsidies that are still maintained on fertilizers, credit, and water for the food staples sector and that no longer serve a useful purpose. This could be a win-win strategy for farmers and the government and at the same time could contribute to national economic growth.

The second challenge for the "new" high-value agriculture is to make it pro-poor. Left to market forces alone, the major beneficiaries of the new high-value agriculture will be mostly the larger and commercially oriented farms, as well as farms that are well connected to roads and markets. The majority of the 300 million or so poor people in India are rural people who depend on agriculture for their living, and many live in the less-favored regions. These people must not get left further behind during the next phase of India's agricultural development.

Fortunately, there is great opportunity to guide the new high-value agriculture so that small farms and even many less-favored regions can be major participants. Achieving broad participation will require improving infrastructure and education in many less-favored regions and communities, ensuring that small farms get the technologies and key inputs they need, and promoting producer marketing organizations that can link small farmers to the new market chains (supermarkets, contractors, processors, exporters, and the like). Small farmers cannot do all of these things on their own, and the public sector, private sector, and NGOs all have important roles to play. Because high-value agriculture demands more working capital, which small farmers often lack, a major effort must be made to reform the rural

credit delivery system to reach smallholders. Innovative institutions promoting vertical coordination between farms, firms, and forks (supermarkets) would reduce transaction costs and market risks and would also act as a conduit to funnel more credit into this venture, especially for smallholders. This system would help lay a foundation for globally competitive agriculture in which smallholders can also participate and prosper. Public policy can make a major contribution by facilitating farmer organizations, standardization, transparent food safety policies, and contract security between farmers and the processing and retail industry.

A third challenge will be overcoming many of the environmental problems that now plague agriculture. Water scarcities will continue to grow, and farmers must learn to use less water and to be less polluting. Land degradation and deforestation must also be contained. A shift toward more diversified and higher-value farming systems will help, both because many of the new crops need less water and because, by increasing returns to land, small farmers will have less need to overexploit poor lands and soils.

Although agriculture can make a significant contribution to growth, employment creation, and poverty reduction, on its own it will not drive the full economic transformation that is now possible for India. A fourth challenge, therefore, is for policymakers to find ways of accelerating growth in the service and manufacturing sectors, which will require continued economic liberalization and privatization.

## 5. Trade and Market Policy Reforms

The policy reforms of the 1990s more or less eliminated the bias against agriculture by lowering industrial tariffs and liberalizing exports of agricultural commodities. This change improved the relative incentives environment (measured as the ratio of agricultural prices to prices of manufactured goods) in favor of agriculture, providing a strong boost to private sector investments in agriculture (see Figure 2).

The liberalization of agricultural exports also led to a major upswing in agricultural exports, at least from 1992/93 to 1996/97. But the years 1997/98 through 2002/03 did not augur well for agricultural exports. The world prices of most agricultural commodities fell sharply, primarily triggered by the East Asian crisis. This decline highlighted the difficulties in integrating domestic agricultural markets with world markets. Whereas developed countries such as the United States and the European Union countries resorted to subsidizing their farmers, developing-country policymakers did not have many options and accepted the loss of those markets.

This outcome raises the fundamental issue of establishing and strengthening a rule-based system in the global trade of agricultural commodities. In an increasingly interdependent world, it is neither desirable nor feasible to

remain insulated from global markets. India, as a major player in the developing world, should play its due role in WTO negotiations and push for multilateral global liberalization of agricultural trade. Although India should insist on substantial cuts in the export subsidies and domestic support being provided to agriculture in the Organisation for Economic Co-operation and Development (OECD) countries, it should also be ready to open up its own markets step by step. Major trade increases are going to take place within the developing world over the next two decades or so, and therefore it would be in India's interest to form a strong coalition of developing countries to open markets while pressing for reducing distortions in developed-country agricultural policies. India's role in the G20 coalition at Cancun proved strong in putting pressure on the OECD countries, but India and its coalition partners Brazil, China, South Africa, and others must engage further to break the deadlock and argue for rules-based open trade. In the event of a slowdown in multilateral negotiations, given the complexities, India should open a second track of negotiations on bilateral and regional free trade agreements with major developing countries in the region (like China) and beyond (like Brazil and South Africa).

India can harvest rich returns from trade liberalization, provided it also carries out large-scale reforms to streamline domestic markets and put in place the infrastructure and institutions to connect local markets with national and global markets. These reforms would involve removing all controls on the functioning of domestic markets, such as movement restrictions, stocking limits on private trade, levies on rice and sugar mills, controls on investments in large-scale agroprocessing and on foreign investments in retail chains, and bans on direct buying from farmers by processors. India should also introduce new institutions such as futures trading that can reduce market risk and promote investments. Further, to integrate the domestic markets with world markets smoothly and manage trade liberalization more effectively, India needs institutions that can closely monitor movements in world and domestic prices and take timely and appropriate actions to avoid major shocks. Here, an institution like an agriculture tariff commission may be more useful than the existing Commission for Agricultural Costs and Prices.

## Summary

In summary, we suggest five areas for action to put rural India on a higher growth trajectory that would cut hunger, malnutrition, and unemployment at a much faster pace than has been the case so far. The five areas for action are interlinked and would best work if pursued in conjunction. We emphasize investments with a human face that include and reach out to the rural poor and a reorientation of subsidies toward such investments.

1. India should increase investments in rural infrastructure (including transport and information technology that

connects villages) and agricultural R&D (leading to improved technologies for farmers). This is our most important suggestion. To ensure high returns on these investments, India will have to invest in institutions that make implementing agencies transparent and accountable to user groups. Part of this expansion of pro-poor investments in rural India should be financed by reducing food and input subsidies, making them available only to vulnerable groups.

2. India should reorient its social safety nets to create more employment in rural areas; help strengthen the human resource base through education, nutrition, and empowerment of women; and build physical infrastructure. In this context, schemes like the EGS of Maharashtra to build rural infrastructure and FFE, well tested in Bangladesh, are much more promising than the untar-geted PDS. These social investments must also address the high prevalence of micronutrient deficiencies (especially of iron, vitamin A, and zinc) among the poor.
3. Water is going to be increasingly scarce. Investing large sums in new mega-irrigation schemes may not be the best course of action, but it is important to complete those in which a lot of money has already been invested. Overall, however, managing water use through institutional changes, such as water rights that are based on farmer groups and water-harvesting schemes in dry areas with local participation, are likely to be more rewarding. Price reforms in irrigation, and even power supplies for agriculture, can succeed only if accompanied by suitable institutional reforms.
4. Indian agriculture faces promising opportunities in the production and marketing of high-value livestock products, fruits and vegetables, and fishery. To exploit these opportunities, India must liberalize its marketing and trade policies to encourage vertical coordination between farms, firms, and forks (supermarkets); facilitate increased flow of rural credit, especially to smallholders, through, say, nonbanking financial intermediaries; and withdraw any special concessions in support of foodgrain policies.

5. Trade liberalization in agriculture has the potential to bring rich dividends to developing countries, including India. To realize this potential, India must work toward establishing and strengthening a rules-based multilateral trading system through WTO negotiations. In the event of major hurdles in WTO negotiations and a delay in reaching any substantive agreement, India should explore its second-best options of reaching bilateral or regional free trade agreements with major developing countries in the region and beyond. Furthermore, to exploit the full potential of trade liberalization, India should carry out “behind the border” reforms by streamlining its own domestic markets, institutions, and infrastructure.

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# Agriculture in South Asia

## Destined for a New Deal

*A synopsis written by Abdul Bayes, Professor of Economics, Jahangirnagar University, Dhaka*

### IFPRI and South Asia

There is growing realization that research undertaken by the International Food Policy Research Institute (IFPRI) has helped to change policy perceptions in South Asia. For example, collaborative research in Bangladesh, Pakistan, and India is believed to have shaped food and agricultural policies in those countries. As part of its continuing work on South Asia, IFPRI recently embarked on a series of seminars in various parts of the region with the main objective of delving into the dynamics of developments in the fields of agriculture, food, and nutrition. Held under the aegis of the institute's South Asia Initiative (SAI), the meetings were also intended to intensify IFPRI's research and outreach efforts geared to the challenges of poverty and hunger in the region. In particular, with the opening of its regional office in New Delhi, India, IFPRI signaled its stronger presence on the ground, its closer ties with clients in the region, and its commitment to confronting food and agriculture crises in South Asia.

The following paragraphs provide an overview of the meetings held in Bangladesh, India, and Pakistan. These three countries vary in size, with India having the largest geographic area, and Bangladesh the smallest. Agriculture is the main source of livelihood in all three, and they are home to the poorest people in the world. At one time, Bangladesh, India, and Pakistan followed inward-looking trade strategies, but since the 1990s, all three countries have opted for outward-looking trade strategies.

The participants in the seminars were scientists from IFPRI and collaborating research institutions, government representatives, politicians, farm leaders, agroprocessors, nongovernmental organizations (NGOs), and other stakeholders involved in the changes and challenges confronting the agricultural sector and the poor. Although the discussions in each seminar were focused on the particular experience of one country, they drew on the experience of other countries to substantiate the empirical findings.

### Facts and Focus

Smallholders and the poor were the focus of the seminars. The most pertinent questions posed were the following:

Can smallholders ride the wave of globalization and emerging domestic transformation, and if so, how? How can poverty be contained through the augmentation of farm income? What types of institutions, infrastructure, and innovations will help smallholders? How can the transformation of agriculture reduce poverty and malnutrition?

In answering these questions, the seminar speakers presented various facts and figures that shape the lives of the people of the region, particularly the smallholders and the poor. The following topics dominated the discussions: (1) agricultural growth and transformation, (2) food security, including biotechnology, poverty, nutrition, and food safety, (3) institutions and governance, (4) the role of the public sector and civil society, and (5) progress toward attaining the Millennium Development Goals (MDGs).

### *Agricultural Growth and Transformation*

The Green Revolution has helped both Bangladesh and India reduce their dependency on cereal imports (in fact, India has emerged as a food surplus nation) and thus avert major food crises recently. In Pakistan, however, a slower growth rate in agriculture in recent years is reported to be adversely affecting poverty levels. Regional yield gaps persist in all three countries, but in Pakistan in particular, concerns about equity and efficiency loom large. Increasing current yield, promoting diversification to high-value crops and activities (especially by smallholders), and vertical integration of activities are seen as panaceas for reducing poverty. Participants in all three seminars felt that a better understanding of supply-side factors was required, along with much more analysis of the demand side, including analyses of the functioning and integration of local and international markets and ways to make those markets work for the poor.

However, most of the discussion in the seminars was driven by the imperatives of the transformation of agriculture that the region faces. The consensus arising out of the seminars seems to be that the "old order" of growing and marketing cereal crops in a subsistence farming system is increasingly being replaced by a "new order" of agricultural practices. Agriculture in the region is now crying for a "new deal." Production and marketing of horticultural crops are gaining ground, and farmers are leaning toward commercial

cultivation. Cereals still dominate in terms of acreage in these countries—which is surely necessary for food security—but developments on other fronts also loom large.

There are many dimensions to the aforementioned developments, but a few should be pointed out. First, the dietary patterns of consumers are rapidly moving away from cereal-based commodities to high-value commodities. For example, per capita consumption of high-value foods is generally growing at 2–10 percent per year, and exports of high-value crops are creeping up, owing to better incentives for export and changing demand in importing countries. Second, the number of supermarkets and other food retail shops has grown dramatically, with growth of 10–90 percent in recent years. The rate of sales of food through supermarkets expanded at 5 percent in poor countries like Bangladesh and at 50 percent in Thailand and the Philippines. Third, contract growing emerged as an important institutional arrangement in which NGOs, agro-processors, and supermarkets compete to procure perishable products. High-value commodities have greatly influenced the diversification of agriculture, which is occurring much faster in urban and peri-urban areas than in near-urban areas and the hinterlands.

In all three countries, the main drivers of diversification include (1) rapid urbanization, (2) faster per capita income growth, (3) a shift from inward-looking to outward-looking trade strategies, and (4) removal of restrictions on foreign direct investment in the food sector. All of these factors have contributed to a change in lifestyles, food preferences, investment priorities, and production decisions.

The degree of diversification and its attendant effects, however, vary across the region. For example, the increase in diversification in Bangladesh is marginal compared to that in India and Pakistan. Supermarkets have begun to increase in number in the Indian states but to a lesser extent in Pakistan and the least in Bangladesh. Foreign direct investment has flowed to the food and retail sectors in India and Pakistan but not in Bangladesh. Contract-growing arrangements have emerged in all three countries. Some foreign companies are operating in India and Pakistan. However, in Bangladesh, local NGOs and agro-processors are taking the lead.

Innovative institutional arrangements that link producers with agribusiness are quietly evolving in these three countries. Cooperatives, the domestic private sector, and multinational firms in a few niche areas initiate most of the models. The impacts of institutional arrangements include (1) access to assured markets, (2) access to reliable information, (3) a reduction in transaction costs and market risks, and (4) higher profits for producers. Case studies have shown that contract farming reduces transaction costs by more than 90 percent for milk and vegetables and by 58 percent for broilers. Net revenue realization by contract growers increased 2–4-fold for milk and vegetables and 1.1-fold for broilers. Small farmers benefited most from the arrangements because they have low marketable surplus and their marketing costs are extremely high.

The road network was found to be a strong driving force behind the diversification trend. Access to electricity and storage facilities reinforced the drive toward diversification. The role of information and communication technology is critical in promoting high-value agriculture. Lack of information about production and postharvest technologies, markets, prices, and export potential is often cited as a major limitation on agricultural diversification and accelerating growth in the production of high-value crops. If access to information could be increased, smallholders would benefit the most.

Although the smallholders grow most of the high-value crops in these three countries, they have yet to enter into the mainstream of the vertical integration mechanism. Thus, they have failed to realize large gains from the emerging transformation of agriculture and increasing globalization. The seminar discussions pointed to two particularly important problems. First, smallholders are handicapped by their small and fragmented landholdings, their meager market surpluses, and the perishable nature of high-value commodities. Second, smallholders also lack information about grades and standards imposed by supermarkets and about sanitary and phytosanitary measures imposed under the WTO system. These factors substantially raise transaction costs and market risks for smallholders in taking the opportunities presented by high-value agriculture.

To change the precarious position of smallholders, the following steps have been suggested. First, develop risk-mitigating strategies to protect smallholders under various production and market-risk scenarios. Second, because production and marketing of high-value agriculture are capital intensive and smallholders are generally starved for capital, agencies and an associated legal framework should be devised to deal with these problems. Third, to avoid breach of contract issues under contract arrangements, legal and regulatory mechanisms should be developed. However, most of the seminar participants emphasized building trust among stakeholders and community participation in the negotiations. Fourth, the public sector should provide assistance for high-value agriculture through investment in infrastructure to bring in private investment. The public sector should also create a favorable business environment. And fifth, to disseminate knowledge about food quality and safety issues to farmers in general and smallholders in particular, the government must develop appropriate infrastructure and expertise.

### *Food Security and Biotechnology*

Despite appreciable progress in the production of cereals, and, hence, commendable progress in the containment of “open hunger,” much of the population in this region suffers from “hidden hunger” with severe micronutrient deficiency. On March 7, 2005, Indian prime minister Dr. Manmohan Singh announced his government’s commitment to the launching of a “Second Green Revolution” as part of the “New Deal” for rural India. According to Singh, this New Deal “is intended to reverse the decline in invest-

ment in agriculture. . . . An important dimension of this 'new deal,' aimed at ensuring food and nutritional security of the people, while at the same time augmenting farm incomes and employment, will be the launching of a 'Second Green Revolution.'"

In Bangladesh, India, and Pakistan, three types of food insecurity are reported to persist to varying degrees: (1) serious under nutrition among the ultra-poor, (2) acute food insecurity among low-income people in the face of floods, cyclones, and droughts, and (3) "hidden hunger" among a large percentage of the population due to their poor-quality, micronutrient-deficient diet. For example, rice prices in Bangladesh have been falling while the prices of nutrient-rich foods are on the rise. If policies to increase the supply of noncereal, nutrient-rich foods such as pulses, fruits, vegetables, and fish are not pursued, the prices of these commodities will increase in the face of income and population growth. The poor are likely to be hit by such price hikes and thus to face hunger. Unfortunately, recognition of the menace of micronutrient deficiency, and research addressing it, are lacking.

Biotechnology is a critical tool that will help these countries reach the MDGs by improving food production and reducing the burden of agriculture on the environment (through better resource management). The safe and sustainable use of biotechnology, especially in developing countries, holds immense potential. India already has one genetically modified (GM) crop, Bt cotton, on the market, and several other important GM crops are awaiting release. Bangladesh has yet to step into the process, but as the seminar participants argued, research is needed on how international markets will change over time and whether Bangladesh will have a strategic advantage as a result. It has been emphatically argued that regulatory mechanisms based on both ethical and biosafety concerns must be implemented. The technology should be viewed as a whole package, one that includes an effective regulatory system, safety precautions, public awareness, and partnerships between the various stakeholders. Because farmers are the largest producers as well as consumers of biotechnology, they should be trained in the socioeconomics of biotechnology. Partnerships between government organizations, civil society organizations, and markets are needed. The partnership approach at the local, national, regional, and global levels holds the key to sustainable solutions to the challenges of the future.

### *Institutions and Governance*

Public spending on agriculture came under serious scrutiny during the seminar discussions. Both "quantity" and "quality" aspects of such spending were debated. Public spending on agricultural research and extension has reportedly dropped drastically in these three countries. Social security and welfare spending in Bangladesh are given low priority. Even if spending remains at current levels, there is room for more agricultural growth and poverty reduction if

public money is allocated optimally. Agricultural research, education, and rural infrastructure are three areas where public spending should be directed. Four research areas were identified: (1) interactions, complementarities, and synergies between different types of investments, (2) financing issues, (3) governance and effectiveness of public provisions, and (4) trade-offs between subsidies and investments and between integrated programs and investment.

Irrigation plays an important role in agriculture and is crucial to food, nutrition, and health security. The demand for irrigation is likely to rise substantially and more so in land-scarce countries where the need for water is already crucial. All three countries face problems with water supply not only for cereal crops but also for the emerging high-value crops. Water scarcity is not the only issue, but a better strategy for managing available water is necessary. The region might suffer serious setbacks in agricultural production, and in health and sanitation, unless water-saving technologies are devised, an irrigation drainage system for high-value crops is developed, cropping patterns are changed, and appropriate prices are set for water supplied by the public sector.

### *The Role of the Public Sector and Civil Society*

Discussion about the power structures and the role of institutional and governance reform in reducing poverty was sharply focused in the Pakistan seminars. It has been argued that skewed distribution of land ownership, low levels of investment in social sector infrastructure and human capital, and underinvestment in the operational and maintenance costs of irrigation are some of the factors responsible for the variability of yields in Pakistan. However, a high agricultural growth rate (5 percent per annum; equivalent to 8–9 percent GDP growth rate) could be achieved by focusing on profitable farming, higher productivity of crops, diversification to high-value crops, progressive livestock and fisheries development, and so on. Although the enormity of the challenges has been recognized, the clarion call went out to government to create the fiscal space necessary to meet such expenditures.

### *Progress toward Millennium Development Goals*

Progress toward meeting the Millennium Development Goals (MDGs) seems to be inordinately slow. On a scale of zero to ten, global efforts to reduce hunger rated only a three, according to the Global Governance Initiative 2005 annual report. Efforts to diminish poverty rated a four. Thus, the world seems to be out of position to meet the World Summit Goal of halving the number of hungry people by 2025 and the MDG of reducing by half the proportion of people living on a dollar day. Like the rest of the world, Pakistan and Bangladesh seem unlikely to reach their MDG targets. Two fundamental questions were raised with regard to prospects for reaching the MDGs: (1) Should the difficulties in reaching the MDGs both globally and in South Asia, and in Pakistan in particular, be attrib-

uted to lack of knowledge about how to implement the interventions that are required? and (2) Are the challenges of reaching the MDGs the result of a shortage of resources or of political will? In answer to these questions, the lack of political will emerged as an important impediment.

However, agriculture plays an important role in meeting the challenges. Half of the world's hungry people live in farm households, and three-quarters of the world's poor people live in rural areas. However, in the process of poverty reduction, partnerships between government agencies, NGOs, the private sector, and research institutes are the most crucial need at this time.

## Policy Priorities and Recommendations

During the discussions, the following policy priorities were tabled:

1. **Agricultural Growth and Transformation:**
  - Increase yield rate of staple grains for diversification.
  - Address water scarcity problems with appropriate designs for irrigation systems, and institute better management of the water supply.
  - Accord high-value agriculture the status of “thrust” sector, and make the appropriate public sector investments in road links, telecommunications, electricity, and storage to bring in the private sector.
  - Devise incentive schemes without distortions for vertical integration and export of horticulture crops.
  - To help smallholders, (1) develop risk-mitigating strategies for production and marketing, (2) ease capital constraints, and (3) develop appropriate institutional mechanisms to deal with horticultural crops.
2. **Poverty, Malnutrition, and Biotechnology**
  - Move from political rhetoric to action.
  - Reform policies and create a favorable business environment.
  - Make markets work for the poor.
  - Restore and conserve natural resources.
  - Reduce the vulnerability of the acutely hungry through productive safety nets.
  - Increase agricultural productivity.
  - Take policy measures to increase the supply of nutrient-rich, high-value crops.
  - Consider the introduction of biotechnology as a complete package where effective regulatory mechanisms, safety precautions, public awareness, and partnership between the various stakeholders are involved.
3. **Public Sector Expenditure**
  - Rationalize expenditure as per productivity.
  - Invest in physical and human capital infrastructure.
  - Increase allocations for agricultural research and extensions specially for high-value crops.

## Future Research Needs

During the discussions, a number of research issues were considered, including the following:

- Regional disparities that exist in the three countries, not only in agricultural productivity and growth but also in nutritional status and poverty levels, must be addressed. Are poverty and child malnutrition indicators related to agricultural growth and productivity?
- Sanitary and phytosanitary standards, the implications of contract farming, and the integration of small farmers need to be explored further.
- Critical areas for trade, marketing, capital markets, and regulatory reforms that can facilitate the integration of small-scale Asian farmers into rapidly growing global markets must be identified.
- The role of governance and power structure in reducing poverty and hunger must be defined.
- Making markets work for the poor.

## Additional Issues

The most important issue not discussed was the gender issue. The role of women in the upcoming agricultural transformation could be an interesting area of discussion. Similarly, the impacts of global trade regimes in agriculture and the consequent preparations needed to face the challenges could also be afforded due emphasis. Finally, the question of free trade in agricultural trade among South Asian countries requires attention in future seminars.

## Concluding Remarks

South Asia is heading for a “new order” of agricultural transformation and is poised for a promising outcome, but institutional arrangements and governance must undergo positive change. To escape the perilous poverty syndrome, the agricultural sector can play a pivotal role if political will is strong.

# Toward High-value Agriculture and Vertical Coordination

## Implications for Agribusiness and Smallholders

Summary of the New Delhi Symposium, India, March 7, 2005

*Organized by the International Food Policy Research Institute, the Confederation of Indian Industries, and the National Council of Applied Economic Research*

### Background

The dietary pattern of consumers in South Asian countries is rapidly shifting from cereal-based to high-value food commodities<sup>1</sup>. A sustained rise in per capita income, urbanization, and globalization are the drivers of the shift in the consumption pattern toward high-value food commodities. Bennet's Law, which states that the proportion of expenditures on noncereals increases as income increases, holds throughout the region. Even the poor are consuming more high-value food commodities. As a result, the domestic demand for these commodities in South Asia has grown 3–5 percent per year, while demand for foodgrains is stagnant. In addition, the export of high-value agricultural commodities is growing due to better incentives for exports and changing demand in importing countries. This transformation of the agricultural sector has profound effects on the nature of the agricultural supply chain, the opportunities for smallholders, and the role of public policy and investment.

South Asian countries are dominated by smallholders. The transformation of agriculture is expected to create opportunities for smallholders but also potential threats to their continued access to remunerative markets. Smallholders are handicapped because of their small and fragmented pieces of land, meager market surpluses, and the perishable nature of high-value food commodities. Smallholders also lack information on grades and standards imposed by supermarkets, and sanitary and phytosanitary (SPS) measures imposed under the WTO regime. These factors substantially raise transaction costs and market risks for smallholders in tapping the opportunities presented by high-value agriculture.

A shift in the production portfolio from foodgrain-based to high-value agriculture implies a greater need for

close linkages between farmers, processors, traders, and retailers to coordinate supply and demand. In particular, genuinely involving smallholders in the process of agricultural transition and linking them with new opportunities to share the benefits is a major policy challenge in South Asian countries. To address the issues of linking smallholders with agribusiness in high-value agriculture, an international symposium, "Toward High-value Agriculture and Vertical Coordination: Implications for Agribusiness and Smallholders," was organized by the International Food Policy Research Institute (IFPRI) jointly with the Confederation of Indian Industries (CII), and the National Council of Applied Economic Research (NCAER) on March 7, 2005, in New Delhi.

### Objectives

The objectives of the symposium were (1) to assess the emerging patterns of agricultural diversification and vertical integration in South and Southeast Asian countries, (2) to explore how smallholders can be involved in harnessing the opportunities presented by high-value agriculture in South Asian countries, (3) to examine the role of the private sector in strengthening vertical integration, and (4) to document the key institutional and policy impediments to accelerating the speed of agricultural diversification. The symposium was attended by more than 130 participants, who constituted a cross section of policymakers, policy advisors, professionals, government think tanks, representatives of the private sector, nongovernmental organizations, farmers, media, and the donor community from South Asian and other countries.

The symposium was organized into three sessions, addressing (1) high-value agriculture and emerging vertical

<sup>1</sup>High-value agricultural goods are generally defined as agricultural goods with a high economic value per kilogram, per hectare, or per calorie; these goods include fruits, vegetables, meat, eggs, milk, and fish.

linkages in South and Southeast Asia, (2) the changing structure of farms and agribusiness in India, and (3) integrating smallholders with agribusiness. The sessions were chaired by Montek Singh Ahluwalia, deputy chairman, Planning Commission, government of India; Amrinder Singh, chief minister, government of Punjab; and Suman Bery, director, National Council of Applied Economic Research.

A summary of the deliberations is given below.

## **High-value agriculture in South and Southeast Asian countries**

A paper, “Growth in High-value Agriculture in Asia and the Emergence of Vertical Links with Farmers,” authored by Ashok Gulati, Nick Minot, Chris Delgado, and Saswati Bora, was presented. It examined the causes and consequences of the shift toward high-value agricultural commodities, with more focus on eight Asian countries: Bangladesh, India, Pakistan, Indonesia, the Philippines, Thailand, Vietnam, and China. The authors argued that unlike the Green Revolution, which was driven by technology (higher-yielding varieties of grain), the current transformation is mainly driven by changes in food consumption patterns. Four key factors affected this change. First, rapid economic growth in many Asian countries has allowed consumers to shift from grains and other starchy staples to higher-value foods such as fruits, vegetables, eggs, dairy products, meat, and fish. Second, urbanization accentuates the shift toward high-value foods by changing lifestyles, increasing exposure to the media, and expanding the availability of high-value foods. Third, the shift toward more outward-looking trade policies has affected production patterns by creating new export opportunities as well as influencing food consumption patterns by increasing access to imported foods. Fourth, many countries in the region have removed restrictions on foreign direct investment; this has affected the food marketing channels, particularly in food processing and (more recently) the retail food sector.

On the consumption side, the paper revealed that while per capita grain consumption was either falling or growing at less than 1 percent per year in the eight countries under consideration, per capita consumption of high-value foods was generally growing at 2–10 percent per year, depending on the country and commodity. Export food demand has experienced similar changes to those observed in the domestic market. This consumption trend has resulted in a noticeable change in the agricultural production portfolio. The growth in grain production has been relatively slow (except in Vietnam, which has become a major rice exporter). In contrast, the annual growth rate of most of the high-value agricultural commodities was 3–8 percent.

Such trends have a noticeable impact on the food marketing system in Asia. First, income growth, urbanization, and the deregulation of foreign investment have

resulted in a dramatic increase in the number of supermarkets and other modern types of food retailers. Annual growth rates vary between 10 and 90 percent, while the share of food sold through supermarkets ranges from less than 5 percent in Bangladesh and Vietnam to more than 50 percent in Thailand and the Philippines. Second, foreign direct investment and growing demand for processed foods have increased the overall size of the food processing sector as well as the scale of individual processing plants. Processed food exports have grown more quickly than overall agricultural exports despite a range of tariff and nontariff barriers. Third, various institutional arrangements linking farmers to other stages of the marketing channel have become more important over time.

The participation of smallholders in this transition depends on (1) infrastructural development that connects them to markets and urban centers, and (2) institutions that link them to high-value food marketing channels. The study revealed that contract farming benefited farmers by providing them with specialized inputs, technical assistance, credit, and an assured market, thus solving a number of problems smallholders typically have in producing new high-value commodities.

## **Examples from India in high-value agriculture**

More detailed discussion by P.K. Joshi and P.S. BIRTHAL, Lyn de Rothschild, Hari Nagarajan and Suman Bery, and S. Shivakumar centered on Indian agriculture. The presenters noted that Indian agriculture is gradually diversifying in favor of high-value food commodities and that the production in particular of fruits, vegetables, milk, meat, poultry, and fish has increased remarkably during the last two decades. This shift is the result of the rising incomes of consumers, the changing tastes and preferences of consumers, and growing urbanization. This shift in consumption patterns is observed not only in the urban areas and high-income strata but in rural areas and low-income groups as well. Demand for high-value food commodities is projected to grow enormously—between 80 and 112 percent, compared to 28 percent for foodgrains, by 2025—even under the existing scenario of income growth.

The rise in the prices of agricultural commodities and agricultural diversification were the main sources of agricultural growth during the reform period (1990s). In the Green Revolution belt, it was the price that was the most important source of agricultural growth. During the prereform period (1980s), it was technology that led agricultural growth. A recent study by IFPRI revealed that high-value commodities have had a significant influence on the diversification of agriculture. This diversification was found to be occurring much faster in urban and peri-urban areas than in near-urban areas and the hinterlands. Also, the road network was found to be a strong driving force behind this diversification trend, which is more pronounced in areas that are connected with at least one national highway.

Innovative institutional arrangements are silently evolving that link producers with agribusiness. Most of the models are initiated by cooperatives, the domestic private sector, and multinational firms in a few niche areas. The impact of institutional arrangements included (1) access to assured markets, (2) access to reliable information, (3) a reduction of transaction costs and market risks, and (4) higher profit for producers. Case studies highlighted that, as a result of contract farming, transaction costs were reduced by over 90 percent for milk and vegetables, and 58 percent for broilers. The net revenue realization by contract producers was two to four times higher for milk and vegetables and 1.1 times for broilers. Smallholders benefited most from such arrangements, as they have low marketable surplus and their marketing costs are extremely high.

The presenters argued that the role of information and communication technology (ICT) is critical in promoting high-value agriculture. Lack of complete and timely information about production and postharvest technologies, markets, prices, and export potential is a major factor often cited as a limitation in promoting agricultural diversification and accelerating growth in the production of high-value commodities. Some successful models have emerged in India relating to ICT in agriculture. The most successful example is an initiative by the Indian Tobacco Company (ITC) on *e-chaupal* for promoting soybean production and marketing. However, the upscaling of the *e-chaupal* model faces a number of constraints. Important among these are (1) a lack of awareness about ICT benefits, (2) the high cost of ICT products, (3) a lack of skills in the use of ICT, (4) a lack of local content, (5) absence of software components in local languages, (6) a high incidence of illiteracy in rural areas, and (7) an unreliable and interrupted power supply.

## Emerging issues in high-value agriculture

A panel composed of Sartaj Aziz, the vice chancellor of Beaconhouse National University of Pakistan; Usha Barwale Zehr, joint director of research at Maharashtra Hybrid Seeds Company, India; and A.K. Chowdhury, of the PRAN Group, Bangladesh concluded that the contract farming and/or cooperative models would successfully link smallholders with agribusiness in high-value agriculture. Promotion of contract farming and cooperatives must be supported by the development of appropriate infrastructure (such as roads, rail networks, power, cold chains, and telecommunications) and the creation of a favorable business environment for the private sector. The discussion raised concerns relating to the following issues:

- The production and marketing of high-value commodities are subject to high risk and uncertainty. Crop failure due to biotic and abiotic constraints and lack of reliable markets may have devastating effects on smallholders. The high price volatility of high-value commodities poses an immense threat to smallholders. Experience has revealed that a marginal increase in

supply results in a steep drop in prices. The issue, therefore, is to develop risk-mitigating strategies that would protect smallholders under various production and market-risk scenarios.

- Financial institutions are expected to play an important role in strengthening vertical coordination. The production and marketing of high-value commodities is capital intensive. Smallholders are starving for capital. The issue is what mode(s) of financing or credit structure(s) could be adopted to equip smallholders for greater participation in high-value agriculture. What agencies could provide such finances and under what legal framework? In case of breach of contract by either firm or farm, who will bear the responsibility for repayment?
- Breach of contract is another issue that must be sorted out. Farmers as well as industrial houses shared their own experiences with breaches of contract. The general opinion was that in the absence of any legal and regulatory mechanism, breaches of contract would persist to derive benefit from the fluctuating market. A transparent and market-driven price would minimize breaches of contract. Experiences showed that contract farming was successful where prices were not predetermined but dependent on market fluctuation, with incentives to the producers for contract. Several cases of breach of contract were reported where the prices of products were predetermined. Representatives of farmers as well as industrial houses emphasized the need for greater trust between both parties. Trust builds with time, when both parties protect the interests of the other.
- The industry was of the opinion that the old existing laws of the Agricultural Produce and Market Committee (APMC) Act are becoming a major hurdle for the entry of agribusiness into contract farming. The act does not allow the direct purchase of food commodities from producers. Similarly, the food retail sector is deprived of foreign direct investment (FDI). The general opinion was that FDI would bring capital and new technology that would promote agricultural diversification and value addition.
- The role of the public sector in promoting high-value agriculture and agroprocessing should be through investment in infrastructure such as roads, rail networks, power, telecommunications, transportation, and handling. Private sector investment would then flow for developing cold chains and processing and packaging industries. The creation of a favorable and stable business climate would attract the private sector into agribusiness.
- The export of high-value commodities requires controls on food safety and quality. Apprehensions were expressed that smallholders might not adhere to the food safety and quality guidelines due to a lack of knowledge and inadequate resources. The panelists argued that at the international level, trade disputes over food safety and quality would increase and might

adversely affect producers from developing countries. Therefore, governments must develop the appropriate infrastructure and expertise so that food safety issues are appropriately addressed.

## Recommendations

Following are the general recommendations that emerged from the discussion:

- To augment income from agriculture, farmers must gain greater access to growing domestic as well as global markets for high-value commodities. This would require the identification of critical areas for trade, marketing, capital markets, and regulatory reforms that can facilitate the integration of small-scale Asian farmers into rapidly growing global markets.
- To increase the participation of smallholders in the high-value supply chain, policies that unnecessarily impede their participation must be removed. Regulations, credit policy, tax policy, and risk-mitigation strategies should be evaluated to ensure that there are no unwarranted impediments to small-scale farmers participating in high-value agricultural sectors.

- To reduce the production and market risks of high-value commodities, good road networks must be developed, a reliable electrical supply must be ensured, and the power of telecommunications must be tapped. Therefore, the government should invest in developing infrastructure that promotes the production and marketing of high-value and processed commodities.
- The role of innovative institutions is critical in strengthening the linkages between the farm and agribusiness. Processes (for example, contract farming or cooperatives) must be developed that involve smallholders in the production and marketing of high-value commodities.

The demand for and supply of high-value and processed commodities will continue to increase in South Asian countries, but the policy directions and institutional innovations will decide the nature and speed of this trend. Favorable policies will involve smallholders and share the benefit of emerging opportunities provided by high-value agriculture.

# The Role of Agriculture in Poverty Reduction in Pakistan

Summary of the Lahore Seminar, Pakistan, March 12, 2005\*

*Organized by the International Food Policy Research Institute and Beaconhouse National University, with assistance from Innovative Development Strategies (Pvt.) Ltd.*

## Background

The challenges facing the agricultural sector in the South Asian countries have grown more complex over time. Increasing globalization has brought additional challenges, and the need for much greater reliance on the private sector and on new crops, activities, and institutions is more obvious than ever before. In Pakistan, in particular, constraints on the availability and quality of land and water, coupled with increasing natural resource degradation, represent major challenges. With an increasingly skewed distribution of access to land and resources and a rapidly increasing population, particularly of poor and small farmers, the need to move from resource-based to science-based agriculture is more pronounced. In the words of Sartaj Aziz, the vice chancellor of Beaconhouse National University of Pakistan, the whole agricultural development paradigm is crying out for a “new deal.”

To examine the ability of agriculture to shape the prospects for poverty alleviation, a daylong seminar, “The Role of Agriculture in Poverty Reduction in Pakistan,” was jointly organized by the International Food Policy Research Institute (IFPRI) and Beaconhouse National University of Pakistan, with assistance from Innovative Development Strategies (IDS). The seminar, held on March 12, 2005, in Lahore, Pakistan, followed the inauguration of the IFPRI South Asia office in New Delhi earlier that month. It represented one more step in IFPRI’s efforts to intensify its work in South Asia under the South Asia Initiative. Simultaneous seminars were held in Dhaka, Bangladesh, and Chennai, India, in an IFPRI Board of Trustees-directed effort to “find new forms of research cooperation and innovative policy options and prescriptions” to meet these emerging challenges and “to develop partnerships with leading institutions in the region to form a shared understanding of the changing research and policy priorities,” according to Isher Judge Ahluwalia, the

chair of the IFPRI Board of Trustees. More than 120 Pakistani researchers, development practitioners, policy-makers, politicians, members of civil society, and students took part in the Lahore seminar.

The primary topics of discussion were the challenges faced in making growth broader based and more pro-poor in order to reduce poverty. Potentially efficient and equitable solutions for achieving increased agricultural growth and poverty reduction addressed in the seminar included increasing current yields as well as promoting diversification to high-value-added crops and activities, especially by the small-farm sector, and the vertical integration of activities “from the farm to the fork.” However, finding the right balance between equity and efficiency in this process was considered the key challenge. Much of the discussion centered on the need to understand how to scale up and link together micro-level activities to maximize gains from economies of scale without sacrificing aspects of equity. For this to happen, the participants felt that a better understanding of the supply-side factors was required, along with much greater analysis of the demand side, including analyses of the functioning and integration of local, national, and international markets and ways to make these work for the poor.

The seminar participants considered the development of market and nonmarket institutions that nurture the process of pro-poor growth to be a key precondition for poverty reduction. In this regard, the analysis of the relative role of the public and private sectors in providing guidelines for the future was deemed to be a crucial factor. The participants considered enhanced access to health and education essential not only for empowerment but also for growth. The very low levels of human and other forms of capital; the inherent skewed distribution of assets and access to resources; and poor overall governance that further exacerbates the relative access to opportunities, security, and empowerment were seen as key challenges.

\*Complete proceedings of the Lahore Seminar are available at: <http://www.ifpri.org/events/seminars/2005/20050312.htm>

Every participant—including the federal minister for food, agriculture, and livestock and the adviser to the prime minister for finance, who chaired different sessions—emphasized the urgent need for effective policy research to meet these challenges. The speakers reiterated this need throughout the day. In addition to analysis of the factors affecting the private incomes of the poor, the participants considered particularly urgent the need to evaluate the whole system of public sector expenditures and service delivery, especially under the newly devolved system of governance in Pakistan, and to ensure that these become more pro-poor and gender sensitive.

The seminar was inaugurated by Sardar Sikander Hayat Khan Bosan, the federal minister for food, agriculture, and livestock, who highlighted the role of inclusive, pro-poor agricultural growth in reducing poverty in Pakistan. He mentioned, in particular, the important potential of the livestock sector for both national economic growth and poverty reduction. He outlined a host of market reforms that the government had initiated and was initiating in the domestic and international trade policy arena in its efforts to move from the role of a player to that of a facilitator. He also stressed the need for effective policy research in support of agricultural growth and poverty reduction.

The seminar consisted of four sessions, the highlights of which are discussed below.

### **Session 1. Rising Poverty Trends: Causes and Remedies**

Akmal Hussain, distinguished visiting professor at Beaconhouse National University and the keynote speaker at the first session, attributed the sharp increase in poverty during the 1990s to three unique characteristics:

1. the country's slow growth (of about 4 percent, substantially below the historical trend rate in Pakistan of 6 percent),
2. declining employment elasticities, and
3. the historically unprecedented increase in inequality.

Reiterating the structural aspects of this growth, he stressed the importance of restructuring the growth process in order to enhance its poverty-reducing capabilities. He stated that the observed instability of growth in Pakistan was also linked to the low-level equilibrium trap that the majority of the poor find themselves in and their inability to break out of the vicious circle. Hussain named some additional structural aspects of this problem: (a) poor soil and suboptimal fertilizer use, (b) poor-quality seed, (c) unequal distribution of land, and (d) an asymmetric market structure.

According to Hussain, modifying the composition of growth involves building new institutions, changing the

asymmetry of power, making markets more accessible to the poor, and providing the masses with quality health and education—all issues that “must become the central concern of those who claim to be engaged in poverty reduction.” In particular, the issue of local governance and the inequitable distribution of land deserves much more serious attention.

Citing health and education as essential growth issues (not merely social-sector issues), he stressed that poverty reduction is about power and the structure of power. Lack of empowerment restricts the access of the poor to these essential services as well as to the realization of their growth potential. Small and poor farmers need fair access to markets and institutions—especially those related to local governance, justice, and the social sectors.

The discussant, Regina Birner of IFPRI, reiterated the importance of power structures and the role of institutional and governance reform in reducing poverty. She agreed that the skewed distribution of land ownership, low levels of investment in social-sector infrastructure and human capital, and under-investment in the operational and maintenance costs of irrigation are some of the factors responsible for the variability of yields in Pakistan. Citing published research, she stated that the indicators of soil quality and water also contributed to the differences between yields on small and large farms in Pakistan. These issues posed major challenges for research and extension.

Identifying successful poverty reduction strategies, Birner cited the extremely high potential return on investment in the social sectors found by previous IFPRI research and the need for investment in social infrastructure to make it more pro-poor. In addition to an analysis of governance reform under the devolution process in Pakistan and an assessment of how to make institutions more pro-poor, she stressed the need to examine the impact of macroeconomic, public finance, and trade issues on poverty reduction. She also called for an analysis of the relative roles of the public, private, and nongovernmental organization (NGO) sectors in empowering the poor in specific situations.

Comments from the floor stressed the need to look at the impact of the composition of government expenditures and the structure of taxation on poverty. Citing the government's various efforts to achieve agricultural growth and poverty reduction, Salman Shah, the adviser to the prime minister for finance, stated that the government's agricultural growth target of 5 percent per year would ensure the 8 to 9 percent GDP growth level envisaged necessary to reduce poverty under a holistic approach. This growth can be accomplished by focusing on more profitable farming; higher productivity of crops; diversification to high-value crops, especially by small farmers; and demand-based production. Progressive livestock development; promotion of agribusiness, particularly in higher-value horticulture crops; and the development of cash crops such as cotton, rice, sugarcane, livestock, and fisheries products are being

undertaken. Speaking of the enormity of the challenges, Shah stated that government policies were only now gradually creating the fiscal space necessary to meet such expenditures. In addition, the co-chair of the session, Mohamed Ait-Kadi, president of Morocco's General Council of Agricultural Development and a member of the Board of Trustees of IFPRI, emphasized the need for research to define appropriate and sustainable remedies for large-scale poverty. Highlighting the importance of appropriate policies, he also stressed that the eventual complementarity or competitiveness of the interconnected goals of growth, poverty reduction, and sustainable management of national resources depends critically on the mix of policies and the investment strategy that the country follows.

## **Session 2. Key Agricultural Policy Issues in Pakistan**

The keynote speaker at the second session, Zafar Altaf, former secretary of agriculture, painted an optimistic picture of the prospects for agricultural growth and poverty reduction. He identified knowledge at the local level and of local conditions as the key constraint on effective policymaking. Altaf highlighted the need to encompass the great diversity of resources, opportunities, infrastructure, and availability of markets in policymaking, as well as the need for policymakers to think in terms of products and not commodities, since several products could be derived from one commodity. In his view, it is the maximization of the value-added potential of these commodities that is the key to agricultural growth and poverty reduction.

Altaf stated that when monopolies exist, markets do not work well for the poor. He highlighted the negative role of vested interests in maintaining the status quo on market and pro-poor institutional development in Pakistan. He also cited the lack of transparency in decisionmaking, the enormous increase of nearly 350 percent in the cost of utilities between 1998 and 2004, and the mounting debt of farmers as additional factors in the low agricultural growth and increasing rural poverty in Pakistan.

He illustrated the poverty-reducing effects of the optimal choice of labor-intensive and capital-saving techniques and scale in successful Hala milk cooperatives, where small dairy producers—mostly women—combine their production to achieve economies of scale that permit them to compete with the much larger corporate giants in this sector.

The discussant, David Orden of IFPRI, noted the role of increased productivity and competitiveness in the agricultural growth witnessed in the United States. He stated that the strong farm lobby was a key element in the country's pro-agriculture policies. He said that one reason that rural poverty had been kept in check in the United States was the large exodus of people from the agriculture sector.

The issue of scale and concentration in agricultural production, processing, and marketing surfaced in the discussion, since the economies of scale in agricultural

processing and marketing may be much more important than the economies of scale in agricultural production. Many participants agreed that it was the vested interests that were actually hindering key market reform. Recognizing that the role of the service sector has been ignored in the post-Green Revolution period, the participants identified the need for manpower skilled in marketing, procurement, and allied supply as a constraint in the move toward more market-based solutions. The possibility of developing these skills without some form of public sector support was also raised.

The session co-chair, Shah Mahmood Qureshi, a member of the National Assembly of Pakistan, stated that the importance of governance and the empowerment of people at the local level in improving decisionmaking and alleviating poverty had not been adequately underscored. He felt that an evaluation of service delivery and empowerment under the new, devolved system of local government in Pakistan was important in understanding why poverty reduction was not taking place.

## **Session 3. Rural Industrialization: Obstacles and Prospects**

Suleman Ghani, Planning and Development Board chairman of the Government of Punjab, was the keynote speaker for the session on rural industrialization. He made a strong case for sustained and rapid growth of rural employment for poverty reduction. Ghani stated that the obliteration of the rural-urban divide under the Local Government Ordinance of 2001 had added an additional challenge in meeting this end. He argued that access to infrastructure would now become the key factor in determining where industry would be located.

In this scenario, the increased potential of the small and medium enterprises (SME) sector to meet rural poverty-reduction needs was highlighted. Among key constraints that prevent the SME sector from playing its role in poverty reduction are a lack of access to finance and infrastructure, an inadequate supporting regulatory framework, and restrictive tax structures hindering the effective development of SMEs. Ghani felt that governance and law and order were serious concerns. Basing his presentation on a recent investment climate survey, he discussed the special needs of SMEs and how these could be met.

Commenting on the keynote presentation, the discussant, David Spielman of IFPRI, raised several fundamental questions, focusing on the following issues:

- The role of the public sector beyond providing a policy framework, and, in particular, in promoting and facilitating rural industrialization;
- The role of the public sector in regulating as well as enabling markets;
- The role of public policy in directing the process of agroindustrialization;
- Ensuring an efficient and effective provision of public goods, such as infrastructure; and

- Creating appropriate incentive structures in public-sector research on agroindustrialization to make it valid and useful.

Spielman felt that the political economy in Pakistan was fundamental to understanding how rural industrialization would actually occur and how the poor would benefit. In this regard, he felt that a clearer identification and linkage of policies with potential opportunities and a better understanding of the relative roles of NGOs and the private sector were important.

Open discussion brought up the debate of efficiency versus equity. One of the main issues raised was the relative importance of both and the possibility of trade-offs. Isher Ahluwalia, in her closing remarks, stressed the need to move beyond the decades-old paradigm of rural industrialization to embrace and address the challenges and opportunities brought about by the emerging new order.

#### **Session 4. Pakistan's Prospects for Achieving the Millennium Development Goals on Poverty and Hunger**

In his keynote address, A.R. Kemal, director of the Pakistan Institute of Development Economics, highlighted the inadequacies of the underlying data and of the different methodologies used to highlight the worsening trends in rural poverty. He felt that although rural poverty had worsened considerably, it was difficult to assess by how much. He called for independent third-party evaluations of the data system for quality control.

To provide an example of the inadequacy and poor quality of the data, Kemal contended that employment elasticity in Pakistan had in fact gone up significantly and that rising unemployment was in fact due to the rapidly growing population and its age structure and was based largely in the informal sector. The keynote speaker at the first session, Akmal Hussain, had made a significant issue of the low employment elasticity in Pakistan as one of the fundamental reasons behind the rapid rise in rural poverty and the potential of the informal sector to absorb a large portion of the unemployment.

Kemal highlighted a number of prerequisites to meeting the MDG growth targets, including reducing the cost of transactions, bringing down the exorbitant costs of utilities (especially electricity), increasing and sustaining the high levels of investment required, and addressing the governance issues that perpetuate inequalities. He felt that

even based on the best estimates of historical trends in investment, it would be difficult for Pakistan to meet, on a sustained basis, the 26 percent investment to GDP ratios required to attain the 8 to 9 percent growth needed to meet the MDG poverty reduction targets.

The discussant, Rajul Pandya-Lorch of IFPRI, highlighted the similarity between the global experience in meeting the MDG targets and the Pakistani one. Pandya-Lorch emphasized that the global decrease of only 9 million in the number of hungry people since 1990 does not suggest that we are moving at the proper pace of reductions required to achieve the MDG for hunger. Given that a further reduction of about 200 million is needed by 2015 to reach the MDG target, the global community is definitely off track in realizing the hunger goal. Projected near-achievement of the MDG poverty goal would still leave 913 million absolutely poor by 2015 in addition to a substantial number of people who survive on between one and two dollars a day and are a very vulnerable group that can slip quickly into absolute poverty.

Pandya-Lorch argued that, despite their limitations, the MDGs give us something to aspire for. Subsequently, two fundamental issues were raised with regard to prospects for MDG achievement: (a) whether to attribute the difficulties in reaching the MDGs both globally and in Pakistan to knowledge constraints or to constraints on the ability to implement the interventions that are required, and, on a related note, (b) whether the challenge of reaching the MDGs is the result of a shortage of resources or of political will.

Sartaj Aziz, in his summary, argued that the real obstacles to poverty reduction were basically political. A real and major breakthrough toward poverty reduction would require much greater political will in one form or another. "Unless that happens," he said, "the progress will be slow; but even then, if the people do get organized, the women get organized, and the empowerment process starts from below and there is enough political leadership and pockets of power which can support them and institutions that can enforce this process, then at least the increase in inequality can be prevented without slowing down growth, and hopefully we can go forward."

The seminar ended on a note of optimism. In the words of Sartaj Aziz, "The combined efforts of IFPRI researchers and Pakistani institutions will be able to come up with sustainable policy research solutions to address the emerging challenges in the fight against poverty, hunger, and malnutrition."

# Nanobiotechnology

## Food, Health, and Nutrition Security

Summary of the Chennai Dialogue, India, March 11–13, 2005

*Organized by the International Food Policy Research Institute, the M.S. Swaminathan Research Foundation, and the XV Genetic Congress Trust.*

### Background

Indian agriculture stands at a crossroads; on the one hand there are the challenges of malnutrition, hunger, and poverty, and on the other hand there are tremendous opportunities and technologies that may hold the answer to many of these challenges. At this juncture, it is necessary to evaluate the challenges and discuss the technologies and new approaches to solve them. While doing this, a holistic approach must be followed, considering social, economic, and ecological consequences.

Biotechnology is a critical tool that will help achieve the Millennium Development Goals by facilitating improved food production and reducing the burden on the environment (through better resource management). The safe and sustainable use of biotechnology, especially in developing countries such as India, holds immense promise.

The conference held at Chennai was an important step in bringing together a cross section of stakeholders representing public and private institutions from India, international organizations, nongovernmental organizations (NGOs), and so on. The sessions were designed to give participants the opportunity to hear cross-sectoral views and to discuss how the latest tools of science and technology, especially biotechnology and nanotechnology, can be utilized to achieve food and nutrition security.

The conference was timely, especially considering that India already has one genetically modified (GM) crop, Bt cotton, on the market, and several other important crops are due to be released in the near future. The conference provided a common platform for researchers, managers, regulators, and technology applicators (such as farmers' organizations and NGOs) to come together and discuss their points of view at this critical juncture.

The emphasis of the conference was on the linkages between health, nutrition, and food security. These linkages need to be identified, and the solution to the challenges should come from a cross-sectoral approach. The conference addressed the impact of globalization on these issues and ascertained that although the problem

may be of local nature, solving the problem is an international challenge and responsibility.

The inaugural session was addressed by M.S. Swaminathan, chair of the M.S. Swaminathan Research Foundation (MSSRF); Joachim von Braun, director general of the International Food Policy Research Institute (IFPRI); and Surjit Singh Barnala. All the speakers, while recognizing the potential role of biotechnology in agriculture, food, nutrition, and health security, also addressed the need for appropriate safety precautions.

### Session 1. Food, Nutrition, and Health Security: Emerging Challenges

The two speakers, Joachim von Braun and M.S. Swaminathan, gave an overview of the current challenges of food, nutrition, and health security; connected these challenges with the Millennium Development Goals (MDGs); and emphasized the importance of establishing linkages between food, health, and nutrition security.

Von Braun explained the "policy sequence" leading toward the MDGs, discussing setting new goals, policy declarations, policy initiatives, policy action/investment, and policy impact on the ground. The implementation of the sequence has already started; the first two steps, goal setting and declaration, have been taken—the challenge is to successfully address the rest of the steps in the series.

The ultimate factor affecting the success of the science of biotechnology is the understanding and consequent acceptance of it by the public. Swaminathan mentioned that in a country such as India, farmers are the largest consumers, and it is important to build understanding among farmers regarding biotechnology and biosafety issues.

Both speakers emphasized the need for partnerships between government organizations, civil society organizations, and the market. It is this type of partnership approach at the local, national, regional, and global level that holds the key to sustainable answers to the challenges of the future world.

The session was chaired by Deepak Pental of the University of Delhi, South Campus.

## **Session 2. Agricultural Biotechnology: Emerging Issues**

Three speakers, Deepak Pental of the University of Delhi, K.C. Bansal of the Indian Agricultural Research Institute (IARI), and Mark Rosegrant of IFPRI, addressed the session. Joachim von Braun of IFPRI chaired the session.

This session addressed the recent developments in biotechnology in India and emphasized the need for more appropriate alternatives to traditional plant breeding, such as marker-assisted breeding, genomic research, transgenics, and so on. Using examples from his own laboratories, Bansal suggested some research priorities for India and discussed the need to effectively take the technology to the farms, build capacity, and develop a partnership approach.

Mark Rosegrant, among others, discussed issues relating to GM crop commercialization, such as regulatory mechanisms in different countries and the cost of compliance. The participants also discussed the need for an effective regulatory system and safety precautions.

## **Session 3. Challenges in Water Resource Management**

Irrigation plays a very important role in agriculture and is crucial to food, nutrition, and health security. The role of irrigation is expected to increase still further in developing nations, where the irrigated area is likely to expand from 202 million hectares in 1999 to 242 million in 2030. Most of this expansion will occur in land-scarce areas where irrigation is crucial already.

The session addressed some of the challenges India faces with regard to water supply. Eighty-five percent of fresh water in India is used for agriculture, and this calls for a better water management strategy. Water scarcity is not the only issue; the ability to manage the available water is also important. The participants discussed use of water-saving technologies, changes in cropping patterns, and partnership models.

The speakers explained the Bhavani Basin project of Tamilnadu in detail and discussed the partnership efforts of the local university, institutes, and international agencies such as IFPRI.

## **Session 4. Genomics and Crop Improvement**

The 20th century ended with epoch-making contributions in the form of complete genome sequences not only of humans but of *Arabidopsis* and a number of other organisms as well. Rice genome sequences will be completed by the end of 2005. The sequence data of these organisms has revealed a great deal of information about the evolution of genomics, the system of genes, and so on. Indian participation in sequencing a part of chromosome

11 of rice (in association with the International Rice Genome sequencing program involving the Biotechnology Centre; IARI; and Delhi University, South Campus) has been very rewarding in many ways. It provided access to complete rice sequence data, helped develop expertise and infrastructure in the frontier areas, and provided an opening in the area of functional genomics. Based on the confidence developed in rice genome sequencing, India has now joined international efforts to sequence the solanaceous genome.

As a follow-up, efforts are now under way to assign functions to the DNA sequences of rice. Scientists are following the application of molecular markers in association with studies on gene expression profiles, as well as the use of knockout mutation to identify genes controlling traits of economic importance and the underlying mechanisms involved.

The genetic engineering of plants has been accepted the world over as a novel approach to crop improvement. This technology has helped in collecting all living organisms into a "single gene pool," providing opportunities to tailor crops with traits of economic importance.

## **Session 5. Genomics and Nutrition Security**

The International Rice Functional Genomic Resources program is involved in developing a large number of knockout mutations involving transposon tagging, mutagenesis, and simple EMS-induced mutations. The restoration of function in these mutants, using a given DNA sequence through transgenesis, will be used to assign a function to them.

Most of the structural and functional genomic research is being carried out in publicly funded institutions, and therefore it is hoped that the information products (genes, promoters, etc.) identified by these efforts will be available to national agricultural research centers in developing countries for their use in crop improvement.

The rice genome sequence is expected to be completed by the end of 2005. Indian participation in sequencing a part of chromosome 11 of rice has been significant. Collaboration between the International Rice Research Institute, IARI, Delhi University, and a consortium of agencies has exhibited a rewarding partnership model. Based on the confidence developed in the rice genome sequencing, India has now joined international efforts to sequence the solanaceous genome.

While technological interventions to improve the quantity and quality of food are very important in India, it should be noted that about 30 percent of the food produced currently is wasted every year as postharvest losses. Efforts to preserve what is produced will also make a significant contribution to food and nutrition security. Research and policy endeavors relating to postharvest technologies deserve more attention in the country.

## Session 6. Nanobiotechnology and Implications

There is need for a clear identification of the potential of nanobiotechnology in meeting the MDGs in the area of health and sustainable food security. R&D programs in the area should have a sharp focus and a well-defined methodology for measuring the relationship between financial outlay and scientific and social outcome. The Department of Biotechnology of the government of India may organize a brainstorming session to identify thrust areas and to assess the scope of investment needed.

Based on the outcome of this in-depth discussion, a National Challenge Program on Nanobiotechnology and Food and Health Security may be designed and launched. Such a program should bring together all appropriate R&D institutions in the country (universities, Indian Council of Agriculture Research (ICAR), Indian Council of Medical Research (ICMR), Department of Biotechnology, Council of Scientific and Industrial Research (CSIR), and nongovernmental institutes). The National Challenge Program should have well-defined goals and built-in monitoring mechanisms. It should also provide for public-private partnerships based on a well-defined agreement regarding benefit sharing, intellectual property rights, and so on.

## Session 7. Public-Private Partnership in Biotechnology

The MDGs are a global concern and can be met by taking a partnership approach. The partnerships between the following key developmental factors are critical:

- International and national institutions
- Various public and private partners within the country
- The role of public policy in directing the process of agroindustrialization;
- Technology developers (scientists) and technology adapters (farmers and consumers)
- Different approaches such as breeding, water management technologies, biotechnology, natural resource management, and so on

The session emphasized the need for capacity building and efforts to strengthen public understanding. The participants emphasized that there is an urgent need for greater interaction between scientists and media personnel on the risks and benefits associated with biotechnology and nanobiotechnology. There should be periodic workshops in regional languages. There is also a need for more media resource centers like the Hindu Media Resource Centre at MSSRF. Well-informed media can help bring about a common understanding between scientists and society.

## Session 8. Biotechnology Regulations and Implications

India has a comprehensive regulatory framework that also emphasizes the agronomic performance of the transgenic material before it is released in the field. While the precise evaluation of risks is very important, the regulatory mechanism should also weigh the advantages of the technology. It is important to evaluate the risks of using the technology and also the risks involved in not using the technology.

The session participants discussed the transparency, time efficiency, and cost implications of the current Indian regulatory system.

Regulatory mechanisms must be based on both ethical and biosafety concerns. The proposed National Biotechnology Regulatory Authority could have a Standing Committee on Nanobiotechnology. The prior approval of the Ethical Committee of the National Biotechnology Regulatory Authority should be obtained before a research project is launched. The precautionary principle should be followed in cases in which the available scientific evidence is insufficient to allow definite conclusions on long-term social, environmental, and health impacts.

The session addressed the current regulatory system in India and the biosafety implications of genetically modified organisms. The participants argued that the national framework should evaluate GM products irrespective of transgenic copy, method of transformation, or source of genes used, and suggested that CGIAR (Consultative Group on International Agricultural Research) institutes should play a more active role in strengthening the current system and act as an honest broker in promoting safe yet sustainable development and use of the technology.

## Conclusion

The three-day seminar highlighted the issues affecting biotechnology development and discussed effective technologies and methodologies for bringing safe and sustainable solutions to the challenges. The potential role of biotechnology in achieving the MDGs was recognized; however, seminar participants argued that the potential of the technology will be realized only when the technology is viewed as a complete package—one that includes an effective regulatory system, safety precautions, public awareness, and partnerships between the various stakeholders.

# Food Policy in Bangladesh

## Issues and Perspectives

Summary of the Dhaka Seminar, Bangladesh, March 13, 2005

*Organized by the International Food Policy Research Institute, the Bangladesh Institute of Development Studies, and the Bangladesh Rice Foundation.*

### Background

Recent economic reforms in South Asian countries have improved the living standards of the population in the region and have further integrated the region into the global economy. Yet the challenges of eliminating poverty, hunger, and malnutrition remain. South Asia is the home of 39 percent of the world's poor who earn less than a dollar a day.

In March 2005 the International Food Policy Research Institute (IFPRI) launched a series of programs to intensify its research and outreach efforts aimed at addressing the challenges of poverty and hunger in South Asia. March 7 marked the opening of the South Asia regional office of IFPRI in New Delhi, India. The office will give IFPRI a stronger presence on the ground, closer to its clients in the region and the issues that confront them. The opening of the new South Asia office was followed by country seminars in Bangladesh, India, and Pakistan on topics of particular interest in those countries.

### The Seminar in Bangladesh

Bangladesh has made commendable progress in several development areas, including reducing population growth and child mortality rates, coping with natural disasters, achieving gender and urban-rural parity in primary and secondary education, and mainstreaming women into the development process.

In the decades since the 1974 famine, Bangladesh has moved from being chronically food-deficit to the brink of food self-sufficiency. Foodgrain production has almost doubled, while marketed quantities have increased by more than sixfold. The focus of food policy has shifted perceptibly in recent years. A complete picture of food security is now provided by adopting the framework of food availability, access, and utilization, while recognizing explicitly that Bangladesh's success in reaching the goal of

achieving national self-sufficiency in foodgrains is only one part of solving the problem of food insecurity.

The government has liberalized grain trade and dismantled the public food rationing system. Instead of using public distribution as an outlet for public food procurement and price support, the emphasis has shifted toward strengthening social safety nets and disaster mitigation programs, and procurement and stocking are now being carried out up to the level necessary to sustain those programs.

Despite these positive changes in food policy and progress in economic growth, pervasive poverty and undernutrition persist. The most disturbing consequence of widespread poverty is that over 40 percent of the country's 140 million people cannot afford an adequate diet. Furthermore, one-fifth of the population is ultra poor and remains seriously underfed due to inadequate purchasing power. Chronically food insecure and highly vulnerable, these people remain largely without assets (other than their own labor power) to cushion lean-season hunger or the crushing blows of illness, flooding, and other calamities.

Information generated through policy research strengthens the empirical basis upon which governments can make informed policy choices. In Bangladesh, research and outreach have played important roles in shaping the policymaking process. To further help reinforce the links between research and policymaking, a seminar entitled "Food Policy in Bangladesh: Issues and Perspectives" brought together more than 90 participants to consider strategies for reducing hunger and poverty in the country. Bangladeshi and IFPRI researchers (from both inside and outside the country); key ministers and senior government officials concerned with food policy issues; and experts from government, nongovernmental organizations, universities, research institutions, and international organizations participated in the seminar. Held on March 13, 2005, in Dhaka, the seminar was sponsored by IFPRI, the Bangladesh

Institute of Development Studies (BIDS), and the Bangladesh Rice Foundation (BRF).

Saifur Rahman, M.P., minister for finance and planning, addressed the inaugural session of the seminar. “Only economic development will eventually be able to give [food] security, and economic development is a total development process—not a directed one,” said Rahman. He told the audience that the government is pursuing policies consistent with the Millennium Development Goals (MDGs) and a market-led regime to generate employment and raise purchasing power so that people can have access to the food available on the market. “Because of such policies,” he said, “there is no starvation and death from food shortages despite three recurring floods.” Rahman stated that government intervention and decentralization are not solutions to achieve food security in Bangladesh. “Without a pro-poor and stable institutional framework, decentralization is chaos and a waste of resources,” Rahman added. He emphasized the importance of investments in rural development and infrastructure for agricultural growth and income generation.

The seminar was structured in three sessions. Highlights from each session and some conclusions follow.

## **Session 1. Food Security: Emerging Issues and Challenges**

Rahman was chief guest for the first session. M. Syeduzzaman, chair of BRF, chaired the session. IFPRI director general Joachim von Braun presented the keynote paper. The two discussants of the keynote presentation were economist Wahiduddin Mahmud, professor at the University of Dhaka, and Shenggen Fan, IFPRI senior researcher.

Syeduzzaman noted that this was the first seminar of its kind. He said that a new agriculture strategy is in development that includes privatization, the support of public resources, public-private partnerships, and constant commitment from all those involved. He commented that there had been a noticeable slowdown in agricultural progress in the 1990s. However, new technologies have been developed and there is a renewed emphasis on the environment and sustainable development.

In his keynote speech, von Braun sketched a global policy perspective of food security and then put forward the relevant policy parameters that might apply to Bangladesh. Finally, he highlighted some promising national and global actions.

“Not only ask: how many are hungry, who, and where are they? But also ask: why?” von Braun suggested to researchers who make food and nutrition security assessments. He noted that it is of strategic importance for national policy to address hunger and food and nutrition problems, and suggested that attention should be paid not just to instances of “open hunger” but also to “hidden hunger” due to micronutrient deficiency. To achieve the MDGs, it is the responsibility of governments and interna-

tional communities to change the food security situation in the world. He cautioned against too much decentralization, and supported partnerships among government agencies, nongovernmental organizations (NGOs), the private sector, and research institutes. He suggested that Bangladesh adapt the UN-sponsored “Hunger Task Force” recommendations to its circumstances: (1) move from political rhetoric to action, (2) reform policies and create an enabling environment, (3) increase the agricultural productivity of food-insecure farmers, (4) improve nutrition for the chronically hungry and vulnerable, (5) reduce the vulnerability of the acutely hungry through productive safety nets, (6) make markets work for the poor, and (7) restore and conserve natural resources essential for food security.

Von Braun emphasized that incremental investments are needed in targeted interventions that maintain a balance between growth and rural development. Finally, he underlined the fact that IFPRI’s new South Asia office in New Delhi serves the entire region, and that IFPRI will continue to work in Bangladesh, building on its three decades of collaboration with the country.

Mahmud noted that IFPRI has had a record of performing collaborative research in Bangladesh that has helped shape the country’s food and agricultural policies. “This is all the more praiseworthy because the influence on policy has been achieved by the strength of analytical work rather than through the leverage of aid conditionality,” said Mahmud. He commented on von Braun’s point that there is a need to strengthen governance in order to eliminate hunger and noted the positive trend in developing countries toward holding elections. “I am sure he [von Braun] will agree that the quality of democratic governance he has in mind is not automatically ensured by merely having an elected government,” said Mahmud. “...The issue of governance should not be treated as a black box; we need to unbundle it and look for innovative institutional arrangements.” Mahmud maintained that Bangladesh has pursued market-oriented reforms in agriculture, privatizing tubewell irrigation and input markets and liberalizing foodgrain imports, leading to positive results. However, the country spends very little on agricultural research and development. Mahmud further stated that while allowing private rice imports from India has helped Bangladesh stabilize domestic rice prices in the recent years of food scarcity, domestic rice producers may often need to be protected from cheap imports through a flexible import tax policy.

Fan emphasized the importance of public investment in poverty reduction. He observed the downward trend in government spending on agriculture in recent years, stagnating infrastructure investments in Bangladesh, and the low priority given to social security and welfare spending. In contrast, spending on health and education has increased. He noted that the returns on public investments in developing countries vary drastically across different types of investments and across regions, even within the

same country. “This implies that there is a great potential for more growth and poverty reduction, even with the same amount of investment, if public resources are allocated optimally,” said Fan. “Agricultural research, education, and rural infrastructure are the three most effective public spending items in promoting agricultural growth and poverty reduction.” He suggested four areas for future research: (1) interactions, complementarities, and synergies among different types of investments; (2) financing issues; (3) governance and effectiveness of public provisions; and (4) trade-offs between investment and subsidies, and between targeted programs and investment.

#### *Key points raised in open discussion*

Policy reversal for agricultural spending was called for in view of the decreasing funding for agriculture and resulting decline in agricultural growth. The terms *poverty*, *food insecurity*, and *hunger* are used interchangeably—clear definitions of all three terms are needed. There is a lack of attention to the quality of civil service that often leads to policy failure. In order to realize the MDGs, there is a need for corresponding commitment from the donor community. If new technologies are to be introduced, the government and donors should take into account risk-management scenarios. Making markets work for the poor is a challenging task.

## **Session 2. Bangladesh’s Agricultural Strategy: New Perspectives**

M.K. Anwar, M.P., minister of agriculture, was chief guest, and Mandivamba Rukuni, a member of the IFPRI Board of Trustees, chaired the second session. The keynote speaker was BIDS director general Quazi Shahabuddin. IFPRI emeritus research fellow Raisuddin Ahmed and former secretary of agriculture A.M.M. Shawkat Ali were discussants.

Scholars in the 1970s and 1980s argued that the preponderance of small and marginal farmers and the widespread prevalence of sharecropping tenancy that characterized Bangladesh’s agrarian structure would impede technological progress and constrain agricultural growth. “These apprehensions have proved to be wrong,” said Shahabuddin in his keynote speech. “In fact, the diffusion of new technology has led to institutional changes. Sharecropping has given way to fixed-rent tenancy in the cultivation of modern varieties, and the tightening of the labor market during the busy agricultural seasons has led to a change in the labor contractual arrangements from daily-wage to piece-rate contracts.” The areas that have yet to benefit from modern technology are those where irrigation development is uneconomical at the input-output price configuration. Agricultural policy should target factor productivity, investments, and risks by (1) rationalizing public expenditure allocation with enhanced public investment in rural infrastructure, (2) inducing a shift in the relative prices of inputs and outputs to correct market distortions, (3) putting in place an appropriate legal and regulatory framework, and (4) carrying out institutional

reforms that make both the public and private sectors more transparent, accountable, and efficient. Such policy changes would help conserve both public and private resources and encourage investment in the agricultural sector. Shahabuddin further stated that the World Trade Organization (WTO) rules provide several opportunities upon which Bangladeshi agriculture can capitalize through policy actions. As a least-developed country, Bangladesh is exempt from WTO rules on tariff reductions, export subsidies, and domestic support for agriculture. Bangladesh should avail itself of emerging opportunities in fast-growing import markets by increasing the spread and value-added of export commodities.

Ahmed commented that, in order to be competitive on the global market, Bangladesh will have to look for suitable high-value crops and agricultural products, and place more emphasis on fisheries, livestock, and forestry. He called for an overall increase in research expenditures, and not simply reallocation of funds among subsectors. He also noted that microcredit does not work for medium-size farmers, who are the real producers. Attention must be paid to environmental issues as well, he argued, including land and water contamination and natural resource management.

Ali highlighted the issue of the contract farming system and called for more research to assess how it is working. On the issue of diversification to high-value noncereal crops, he noted that the private sector is increasingly involved in producing vegetables and other horticulture crops. However, institutional issues do cause impediments—for example, national institutes of biotechnology and agriculture are disconnected. “Attention needs to be paid to the linkage between the farm and rural nonfarm economy,” said Ali.

“How should we respond to strategic challenges such as climate change?” asked Rukuni, the chair of the session. He expressed concern that Bangladesh might lose a large area of fertile delta land to the rise of the sea, and this might worsen difficulties in sharing water resources among neighboring countries.

The session’s chief guest, Anwar, reported that the government has initiated action on issues identified by the recently completed Agricultural Sector Review. For example, a new “seed law” to strengthen the regulatory mechanism for the quality control of all seeds is awaiting approval. Some support for chemical fertilizers has been introduced recently, and programs have been initiated to promote organic fertilizers. The government has exempted all agricultural equipment from import duties. Cash incentives are given to enhance exports of agricultural products. The interest rate on agricultural credit has been lowered. Rebates on electricity are given for irrigation and agro-based industries. “We are constantly reviewing our actions and strategies relating to the emerging challenges of agriculture and looking for advice from those who are more knowledgeable and learning from those who are more experienced,” said Anwar.

### *Key points raised in open discussion*

Biotechnology will have the greatest impact in backward regions of the country. Research is needed on how international markets will change over time and whether Bangladesh will have a strategic advantage as a result. There has been little structural change in labor employment, and agriculture is still absorbing about 50 percent of the labor force. The focus should be to look at strategic challenges and how to respond to emerging new issues.

### **Session 3. Disaster Management, Safety Nets, and Nutrition Interventions**

Kamal Ibne Yusuf, M.P., minister for food and disaster management, was chief guest for the third session. BRAC (formerly known as Bangladesh Rural Advancement Committee) executive director Abdul-Muyeed Chowdhury chaired. IFPRI senior research fellow Akhter Ahmed presented the keynote paper. Naser Farid, director of the Food Planning and Monitoring Unit of the Ministry of Food, and Sajjad Zohir, senior researcher at BIDS, were discussants.

In his keynote presentation, Ahmed highlighted three types of food insecurity: (1) serious undernutrition among the ultra poor, who are about one-fifth of Bangladesh's 140 million people; (2) acute food insecurity among low-income people as a result of shocks such as floods, cyclones, and droughts; and (3) "hidden hunger" among a large percentage of the population owing to a poor-quality, micronutrient-deficient diet. Whereas the price of rice has been falling in Bangladesh, the prices of other, nutrient-rich foods are on the rise. "If policies are not undertaken to increase the supply of noncereal, nutrient-rich foods such as pulses, fruits, vegetables, and fish," said Ahmed, "the prices of these foods will continue to increase in the face of income and population growth. Consequently, the diet quality and nutritional status of the poor are likely to deteriorate further." Ahmed told the audience that Bangladesh has made significant progress in strengthening social safety nets to assist the poor. The government has shown a remarkable willingness to evaluate program effectiveness, confront shortcomings, and cancel or modify programs as a result. However, income seasonality remains unaddressed by the existing safety nets. Ahmed proposed a consumption credit program for the poor to mitigate transitory food insecurity during the lean season. To improve diet quality, he called for increased agricultural investments in high-nutrition nonstaples, and for support of the biofortification of staple crops with micronutrients.

Farid commented that, despite various government and NGO initiatives to improve the food security of the poor, about 6 million ultra poor in Bangladesh still remain beyond any kind of food safety nets. "We have about 40 food safety-net programs to address the ultra poor and vulnerable," Farid said, adding that there has been a decline in the availability of food-based safety nets in recent years.

Zohir emphasized the need to verify whether programs actually cover the group initially targeted and to assess the extent of failure in targeting. He also called for the estimation of the size of leakage across safety-net programs.

Session chair Chowdhury commented that relief is needed immediately after a disaster, but credit is needed soon thereafter to restart the development process. "BRAC is targeting the ultra poor with various development-oriented safety-net programs," he added.

Yusuf, chief guest for the third session, stated that Bangladesh is highly prone to natural disasters such as floods, cyclones, and occasional droughts. Coping with disasters diverts many of the government's efforts and resources away from long-term development priorities and into short-term crisis management. He reported that the government has adopted a holistic framework embracing all aspects of vulnerability and risk management. "We have developed specific codes to address cyclones, floods, drought, and famine, and now we are preparing codes for earthquakes and tsunamis," said Yusuf.

### *Key points raised in open discussion*

While raising social awareness about micronutrients in the diet is important, legislation is also required at the appropriate levels. Research needs to be carried out on intra-household food distribution during shocks. The government uses open-market sales of rice at a subsidized price to address seasonal food insecurity.

### **Conclusions**

Participants noted that IFPRI can play an important role in Bangladesh in researching the policy angles of social safety nets, agricultural research, education, rural infrastructure, and public investments.

IFPRI research fellow emeritus Nurul Islam made the closing remarks. He highlighted a number of current and emerging food policy issues in Bangladesh addressed in the seminar, and identified gaps in research.

Future research must address regional issues, he argued. Regional disparities in Bangladesh exist not only in agricultural productivity and growth, but also in nutritional status and poverty. Are poverty and child malnutrition indicators related to agricultural growth and productivity?

On the issue of high-value agricultural products, what are the driving forces for producing these products? The issues of sanitary and phytosanitary standards, the integration of small farmers into the marketing chain of exports of high-value products, contract farming, and diversification of exports need to be explored.

On the question of agricultural subsidies, the WTO allows least-developed countries such as Bangladesh to maintain much higher levels of subsidy than the country has today. Should Bangladesh increase its subsidies to the limit set by the WTO?

Bangladesh has achieved great success in reducing infant mortality, but the success in reducing child under-nutrition is modest. Why is this so? The determinants of infant mortality and child undernutrition must be identified in Bangladesh's socioeconomic context.

Bangladesh has become a leading developing country in providing access to safe water to its entire population. Are

the poor now more vulnerable to water-borne diseases due to the closing down of hand pumps in areas with high levels of arsenic contamination of the groundwater? The current and emerging problems related to arsenic contamination of water should be analyzed in the context of agricultural productivity (nature of irrigation techniques, use of chemical fertilizers, etc.) and poverty.

# IFPRI's South Asia Initiative

With 44 percent of the world's poor (defined as those living on less than a dollar a day), South Asia has the largest concentration of global poverty. While the specter of widespread famine no longer haunts this region, the challenges of reducing poverty and facilitating economic access to food remain daunting. As a first step in addressing these challenges, IFPRI has created a Policy Analysis and Advisory Network for South Asia (PAANSA), bringing together scholars, policy advisors, policymakers, and other stakeholders to prioritize issues for research in the region. Second, IFPRI carries out applied policy research on priority issues in selected network countries and in collaboration with local experts to help diagnose problems, suggest policies to reduce poverty and hunger, and promote dialogue among policymakers. And third, IFPRI disseminates research results and presents policy alternatives to a wider audience through conferences, workshops, and other media. Several studies relating to agricultural trade, market reforms, diversification, and food security are already being implemented under the South Asia Initiative.



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