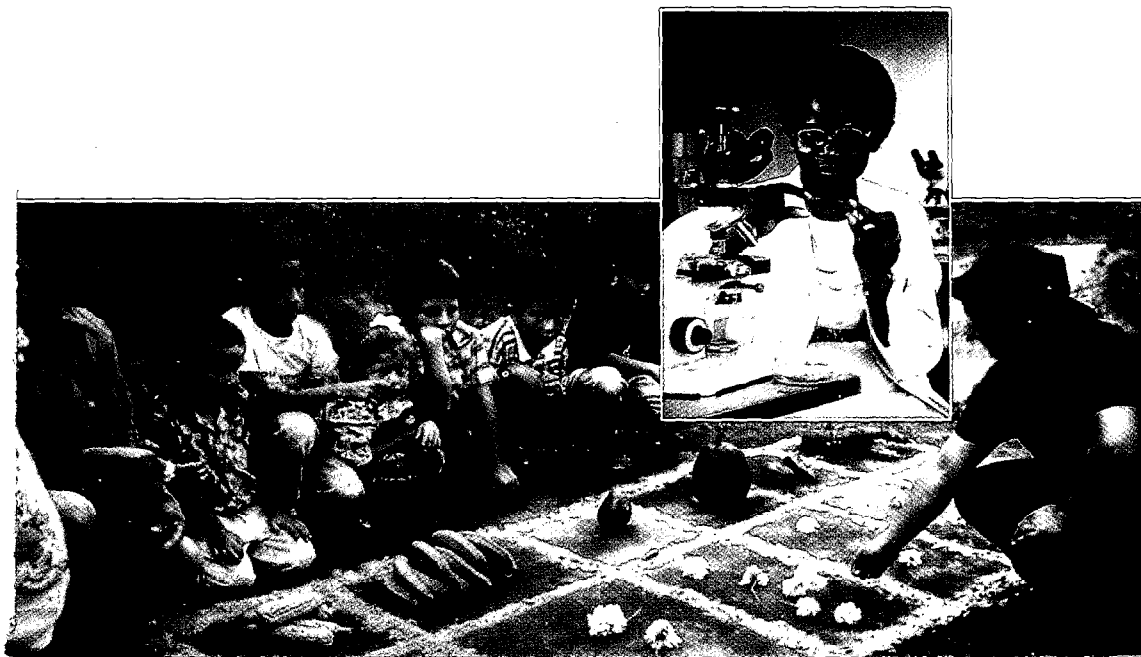




THE CGIAR AT TWENTY-FIVE: INTO THE FUTURE

*Policy Statements
by
Ismail Serageldin*

International Centers Week, October 28--November 1, 1996





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Consultative Group on International Agricultural Research



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ABOUT THE CGIAR

*T*he Consultative Group on International Agricultural Research is an informal association of fifty-three public and private sector members that supports a network of sixteen international agricultural research centers. The Group was established in 1971.

The World Bank, the Food and Agricultural Organization of the United Nations, the United Nations Development Programme, and the United Nations Environment Programme are cosponsors of the CGIAR. The Chairman of the Group is a senior official of the World Bank, which provides the CGIAR system with a Secretariat in Washington, D.C. The CGIAR is assisted by a Technical Advisory Committee, with a Secretariat at the FAO in Rome.

The mission of the CGIAR is to contribute, through its research, to promoting sustainable agriculture for food security in the developing countries. The CGIAR conducts strategic and applied research, with its products being international public goods. It focuses its research agenda on problem solving through interdisciplinary programs implemented by one or more of its international centers in collaboration with a full range of partners in an emerging global agricultural research system. Such programs concentrate on increasing productivity, protecting the environment, saving biodiversity, improving policies, and contributing to strengthening agricultural research in developing countries.

Food productivity in developing countries has increased through the combined efforts of CGIAR centers and their partners. The same efforts have helped to bring about a range

of other benefits, such as reduced prices of food, better nutrition, more rational policies, and stronger institutions. CGIAR centers have trained more than 50,000 agricultural scientists from developing countries over the past twenty-five years. Many of them form the nucleus of and provide leadership to national agricultural research systems in their own countries.

LIST OF ACRONYMS

CGIAR	Consultative Group on International Agricultural Research
FAO	Food and Agriculture Organization of the United Nations
GIS	Geographic Information Systems
ICW	International Centers Week, CGIAR
IFAD	International Fund for Agricultural Development
MTP	Medium-Term Plan, CGIAR
NARS	National Agricultural Research System(s)
NGO	Non-Governmental Organization
TAC	Technical Advisory Committee, CGIAR
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
USAID	United States Agency for International Development
\$	All financial data are given in U.S. dollars

CGIAR CENTERS

CIAT	Centro Internacional de Agricultura Tropical
CIFOR	Center for International Forestry Research
CIMMYT	Centro Internacional de Mejoramiento de Maiz y Trigo
CIP	Centro Internacional de la Papa
ICARDA	International Center for Agricultural Research in the Dry Areas
ICLARM	International Center for Living Aquatic Resources Management
ICRAF	International Centre for Research in Agroforestry
ICRISAT	International Crops Research Institute for the Semi-Arid Tropics
IFPRI	International Food Policy Research Institute
IIMI	International Irrigation Management Institute
IITA	International Institute of Tropical Agriculture
ILRI	International Livestock Research Institute
IPGRI	International Plant Genetic Resources Institute
IRRI	International Rice Research Institute
ISNAR	International Service for National Agricultural Research
WARDA	West Africa Rice Development Association

INTRODUCTION

*T*he policy statements in this compilation were made by CGIAR Chairman Ismail Serageldin at International Centers Week 1996.¹ Together, they define the essence of the week's discussions and decisions. Their emphasis is on the enriching power of science, and the need to harness that power for the benefit of all humanity, especially the poor, the destitute, and the hungry.

The policy statements are published as a single volume because of the importance of the themes explored to the future of the CGIAR and its place in the emerging global agricultural research system; and in response to many requests from interested readers for a ready reference source.

International Centers Week 1996 was very special, and differed from past CGIAR meetings in many respects. It was structured as four separate, but connected components: a *Day of Commemoration* of the twenty-fifth anniversary of the CGIAR; a *Centers Forum* on the substance of current and future research; a *Global Forum*; and the *CGIAR Business Meeting*.

Each of the four events provided opportunities for the CGIAR and its partners to review the past and prepare to confront the challenges of the future together. The Day of Commemoration was a program to honor CGIAR stalwarts of the past and present, celebrate twenty-five years of effort and achievement, strengthen partnerships, and look to the future. At the Centers Forum, the heads of CGIAR centers presented the highlights of current research, from regional

¹ The published *Summary of Proceedings and Decisions* of International Centers Week 1996 is available from the CGIAR Secretariat.

perspectives. The regional approach to research challenges led into the next component of ICW, the Global Forum.

The Global Forum demonstrated the dynamism of the emerging global agricultural research system, which aims at being participatory, open, and inclusive, and sensitive to the economic, social, and conceptual framework within which farming communities make decisions. Participants in the Global Forum committed themselves to fulfilling a shared vision in which their combined efforts strengthen the capacity of the agricultural research community to help combat poverty, hunger, environmental degradation, and inequity.

The thread that ran through all components of ICW96 was an emphasis on science—specifically, agricultural science—and its continuing significance as a catalyst of development. The past scientific achievements of the CGIAR were celebrated. Center Directors presented exciting prospects for the application of new science-based technologies to the nexus of problems associated with poverty, hunger, population growth, and environmental damage. An eminent CGIAR scientist, Dr. Gurdev Khush, was a featured speaker. The six (out of ten) CGIAR laureates of the World Food Prize were acclaimed. The CGIAR King Baudouin Award was presented to ICRISAT for outstanding achievement in the development of disease-resistant, yield-increasing pearl millet, and the Chairman's Excellence in Science awards were launched. The CGIAR's future research directions were outlined, and its partnerships strengthened.

A science-based vision of the future, with an emphasis on how scientific capacity and excellence can help to overcome poverty and hunger, increase food productivity, and halt natural resource degradation, was the defining characteristic of International Centers Week 1996, and this is made clear in the Chairman's policy statements which appear on the pages that follow.

SCIENCE IN SUPPORT OF A NEW VISION

International Centers Week: A Day of Commemoration

October 28, 1996

*T*he twenty-fifth anniversary of the CGIAR is an appropriate occasion for us to prepare for the future, drawing deeply from the achievements of the past. We must be concerned with the future, just as our predecessors were twenty-five years ago, because our work affects the survival of humankind: alleviating hunger and poverty on this planet, and ensuring adequate food supplies in the next millennium. These are truly awesome tasks. We dare not shirk them.

Gathered in this room in celebration of the CGIAR's twenty-five years are some of the most distinguished contributors to our past record and future potential. I extend my heartfelt thanks to them all.

I thank our distinguished alumni, several of whom have traveled great distances, for their participation in this celebration. I thank Bank President James Wolfensohn, just returned from an important mission in Asia, for giving us the benefit of his time and insights. His presence is profoundly encouraging. His thoughts and words challenge us to be ever-vigilant against any erosion of our own standards. Thanks, as well, to CGIAR pioneer and great internationalist Maurice Strong, whose Crawford Memorial Lecture truly reflected the spirit that Sir John Crawford represented. I thank CGIAR members and scientists of today, and their many partners: they are the rock-solid foundation of the future. I thank all

those who enriched the celebration in different ways; all of them contributing to a powerful reaffirmation of commitment. I thank those who planned and organized all aspects of this wonderful event.

Years bring atrophy to some institutions. Others become overconfident. Neither condition afflicts the CGIAR. With all humility we can draw strength from the achievements of the CGIAR. They are real, have made a difference in the lives of countless people, and are so recognized. Without these achievements, the world's poor would be poorer today; more would go hungry; more would sicken from hunger-related disease; more would succumb to the sullen bitterness caused by helplessness and hopelessness.

With all humility we can draw strength from the achievements of the CGIAR. They are real, have made a difference in the lives of countless people, and are so recognized. The success of past efforts challenges us to mobilize again to meet new challenges.

So the success of past efforts challenges us to mobilize again to meet new challenges, to chart new courses, to undertake renewed agricultural transformation, and to reach out for the fulfillment of a vision in which the world's deprived and disadvantaged are liberated from the grip of extreme poverty and hunger.

Our vision of the future has to be multidimensional because real life has many dimensions. Our vision has to be people centered, gender conscious, and empowering of the weak and vulnerable.

Our vision must be based on a clear recognition of *access to food* as a basic human right. The Universal Declaration of Human Rights (1948) said that "everyone has the right to a standard of living adequate for the health and well-being of himself and his family, including food." The International Covenant on Economic, Social and Cultural Rights (1966)

proclaimed the “right of everyone to adequate food” and declared that freedom from hunger is a universal and fundamental right. We must work with our partners to transform those principles into living reality, recognizing that food security is more than food production—that it is about poverty reduction and access and nutrition.

Our vision must recognize that development has a cultural content, that respecting indigenous knowledge built up through years of practice helps to develop such a cultural content while at the same time enriching the process of scientific inquiry.

Our vision must encourage us to act in ways that will leave future generations as much as, if not more than, what we found ourselves. We must learn to husband the resources of this fragile planet just as we have learned to enjoy its bounty.

Science, Scientists, and our Vision

Spectacular successes in almost every aspect of life across much of the world in the past few decades suggest that we can dare to hope for a vision fulfilled. Indeed, the developing countries have in many respects covered as much distance in their human development during the past thirty years as the industrial world managed over a century. Infant mortality rates in developing countries have dropped by over 50 percent—from 150 per thousand to 70 per thousand live births. Life expectancy increased by over a third—from 46 years to 62 years. Combined primary and secondary school enrollment more than doubled. Economic growth rates in several countries were high, and continue to rise. One-and-a-half billion people, mostly in East Asia, secured per capita annual income growth of more than 7 percent in the 1980s. If this is the way in which the disadvantaged are all moving, we can truly look to the twenty-first century with great optimism.

But, that's just the sunny scenario. As everyday experience suggests, these statistics tell only half the story. During the same period, another billion people, many in Sub-Saharan Africa, were the victims of a continuous shrinkage of per capita income. Some 17 million people die every year in developing countries from curable diseases. Millions are out of school. Almost a third of the world's population lives in poverty. About 200 million people are affected by desertification. Internal and cross-border conflicts have added to human misery, driving millions of dispossessed people into refugee camps—more correctly, refugee hovels. For them the only vision is a persistent, real-life nightmare.

It does not have to be so.

I see a world where contradictory tendencies coexist; where crisis and opportunity are two sides of the same coin. We must grasp opportunity and subdue crisis.

One set of tendencies is positive. So I see a world in which ever more dazzling advances in science *will be* achieved. I see a world of ever greater interconnectedness through telecommunication, computers, and economic integration. I see a world where greater and greater opportunities exist for the knowledgeable, the nimble, and the able. Small countries, if they have the right skills, attitudes, and policies, will be able to consider the entire world their market, and will be able to tap into endless sources of capital. Growth, prosperity, and well-being will not be hostage to the size of their geographic boundaries, the magnitude of their internal market, or the domestic savings they can mobilize.

But I also see the downside of such a world, speeding toward its knowledge-based economy, with inequities rising between and within countries, with a small elite of rich people in poor countries connected to a global community of sci-

ence, business, and the arts, and with poor people in rich countries joining the vast majority of humanity in the developing world as gaps grow wider, frustrations increase, and the poor everywhere are left behind. If the downside dominates, the contributions of science would give ever more to an ever smaller part of the human family.

It is up to us, and all like us, who are concerned with the human condition, to try to ensure that we harness the power of science for the full benefit of humanity, for the poor, the destitute, and the hungry among us, and for the generations to come.

It is not beyond the ken of human imagination to design approaches that will lead us in this direction—approaches that do not try to deny the knowledge-based economy and all it can bring, or to forestall the advancement of science and all that it can contribute; but that embrace change and harness the best of science in an open, participatory way. For science has a power all its own. It is not just the power of contributing to technological progress, although that certainly is one of its outcomes. It is the power to change perceptions—the power to uphold rationality in public discourse and to inculcate codes of behavior in societies that will enable them to enter a world where the only constant is an ever-accelerating pace of change, where the only boundaries are those of our imaginations, where the only limits are those of our political will. It is just such a world that awaits us. It is just such a challenge to which we must rise.

Throughout history scientists have been praised, condemned, admired, derided, held in awe, or evoked a certain skepticism, depending on the bias in the eye of the beholder.

It is up to us, and all like us, who are concerned with the human condition, to try to ensure that we harness the power of science for the full benefit of humanity, for the poor, the destitute, and the hungry among us, and for the generations to come.

But whatever perspective one brings to an examination of science, the fact is that until the scientific mindset fully permeates a society, it will remain backward and unable to cope with the challenges of modernization. Modernization is not equal to westernization. Japan has clearly shown this. Modernization involves a mindset that adopts science. Nehru made the point clearly when he said in 1961:

Modern technique is not a matter of just getting a tool and using it. Modern technique follows modern thinking. You can't get hold of a modern tool and have an ancient mind. It won't work.

Modernization, as Nehru points out, involves not merely a technical challenge, but a societal challenge and a personal challenge as well.

It is about the scientific mindset.

What is this science that I flaunt before you?

With Jacob Bronowski,¹ I define science as “the organization of our knowledge in such a way that it commands more of the hidden potential in nature.” In that definition it is clear that science goes far beyond the utilitarian application of knowledge. It affects an entire world outlook from cosmology to being.

There is a central core of universal values that any truly modern society must possess, and these are very much the values that science promotes: rationality, creativity, the search

¹ The late scientist and mathematician who wrote “The Ascent of Man,” a seminal work on science and society, based on a thirteen-part series he created for the British Broadcasting Corporation.

for truth, adherence to codes of behavior, and a certain constructive subversiveness. Science requires the challenge of the established order; the right to be heard however outlandish the assertion, subject only to the test of rigorous method. The scientist at her lab bench and the farm family in the hinterland must both share this right. So must the senior scientist and his or her aspiring, inquiring, junior colleagues.

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Indeed the vision of the partnership between the farmer in the field with her practical wisdom honed through the centuries and the scientist exploring the cutting edge of contemporary knowledge in the laboratory is one that is not alien to true scientific values.

We must see science as an integral part of our culture, that informs our world view and affects our behavior. Science has the capacity to capture the imagination and to move the emotions. Science promotes fundamental ethical values in society. Indeed “those who think that science is ethically neutral confuse the findings of science, which are, with the activity of science, which is not” (Bronowski).

Science is a cultural current that brings imagination and vision to bear on concrete problems and theoretical speculation. In Blake’s immortal phrase, “What is now proved was once only imagined.” Imagination and vision are at the very heart of the scientific enterprise. Again, Bronowski put it beautifully when he said, “we are the visionaries of action; we are inspired with change. We are the culture of living change.”

Agricultural Scientists and the Tasks of Change

Agricultural science can open the doors to pervasive, societal change. For all of us, whatever our calling or specialty, depend on agricultural science. We are all the guests of the green plants and those who tend them and the animals who use them. This is why agricultural science is sometimes described as the “Queen of the Sciences”—a queen whose reign is universal.

Overcoming poverty and hunger, increasing food production, and halting natural resource degradation require action on a broad and complex rural development front. We need to intensify complex agricultural production systems sustainably while preventing damage to natural resources and biodiversity and contributing to the improved welfare of farmers, especially smallholders and the landless. These are momentous challenges. Science can enable us to meet them.

Carl Sagan recently pointed out that “without agricultural technology the earth could only support tens of millions of people, instead of billions.” Therefore, he continued, “almost everyone on earth, 99 percent of us, owe the very fact that we’re alive and haven’t starved to death to the existence of agricultural technology.” But agriculture is not only a means of producing more to feed more people. Agricultural transformation is the trigger that can help the human family cope with the nexus of problems relating to poverty, hunger, and environmental degradation.

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lenges. I am convinced, however, that science can enable us to meet them. Let me give you some flavor of what I think science can contribute.

Perhaps the most urgent direct contribution of science to the debate on food security today is to get the facts right. So much of the debate among policymakers, advocacy groups, and in the media is based on partial figures and incomplete or inaccurate information that the public cannot engage in a sensible discussion. What virtue is there in carrying out a febrile debate on food production in China when the protagonists use vastly divergent figures of the acreage of Chinese land under cultivation on which the yield figures depend?

Clearly, new breakthroughs in Geographic Information Systems and computing make it possible to obtain more accurate figures on these kinds of questions. More importantly, such developments will enable the ecological site-specific data and the socioeconomic data to be mapped at the local to the supranational levels, offering for the first time the possibility of substantial relational databases being developed with all the advantages for analysis that such developments entail. Maintaining and making available proper databases thus becomes another major contribution that scientists can make to the better understanding of the issues and the monitoring and evaluation of trends by countless researchers and groups.

Small, portable satellite-based Global Positioning Systems are making field work and verification of satellite imagery a routine affair. We have seen its practical application in the U.S. “smart farming” techniques.

Beyond using GIS/computing, databases, and scientific interpretation, the international scientific community can state problems accurately, define areas of uncertainty and risk, identify new technologies, and help set the boundaries of debate.

I suggest that in stating the problem of food security, poverty reduction, and environmental conservation accurately, we would say that it is:

- not just about *production*, but also *access* for the poor;
- not just about *output*, but also *process* of production;
- not just about *technology*, but also *policy*;
- not just about *global* issues, but also *national* circumstances;
- not just about *national* balances, but also *household* conditions; and
- not just about *rural* poverty, but also the *urban* poor who should command our attention.

All these dimensions make the issues of food security part of a bigger whole where many policies come together. Accordingly, research programs need to be guided by some additional considerations: biodiversity preservation; environmental concerns; the changing interface between the public and private sector; intellectual property rights; bioethics; and the need for greater stakeholder participation in the research process.

Preserving biodiversity is a crucial aspect of the agricultural research process. CGIAR centers have addressed this for many years and have responsibly placed their accessions under the sponsorship of the FAO's Commission on Global Genetic Resources. Meanwhile, the global systems relating to the conservation and sustainable management of genetic resources are in a state of transition. The Convention on Biological Diversity, now ratified by 129 of the 185 countries

that have signed it, recognizes genetic resources, whether flora, fauna, or microorganisms, as the sovereign property of the people of the nation within whose borders such diversity exists. Here is an area in which many groups need to work together to ensure that we can increase our use of this biodiversity and that our common heritage is protected and preserved for the future.

Turning to another area, research on postproduction technologies has received less attention than is warranted. There is an enormous expansion of urban population in developing countries and it has implications for food security. Rapid urbanization adds a special urgency to the need for more storable and transportable food, at a low cost. Postproduction technologies must address these needs and those of the rural world.

The greater use of biotechnology is perhaps the most exciting contribution that science can make to food security in the next century. Radical and rapid changes in our understanding of molecular biology have spawned a potential biotechnology revolution. The application of biotechnology was pioneered in the medical sciences, but agricultural science has been catching up. There has undoubtedly been concern that the application of biotechnology in agriculture is occurring more slowly than its enthusiasts predicted.

Yet today, some fifty plant varieties—from alfalfa to wheat—have been biotechnically altered since the first success was recorded in gene manipulation in the 1980s. The value of sorrel products from biotechnology in agriculture in the U.S. market alone is \$380 million in sales in 1996, with predicted

The greater use of biotechnology is perhaps the most exciting contribution that science can make to food security in the next century. Radical and rapid changes in our understanding of molecular biology have spawned a potential biotechnology revolution. The CGIAR centers are exceptionally well placed to deploy modern molecular technologies, and to develop new varieties with greater speed and precision.

growth in the market of 20 percent per annum over the next decade.

The opportunities for producing transgenic varieties are endless. Plants and animals that use water more efficiently, grow in highly adverse conditions, resist pests and diseases, and use fewer inputs have enormous potential to contribute to the sustainability of agricultural production systems and are representative of the range of possibilities which may develop through biotechnology. Biotechnology also has great potential in livestock and fish production, and in the modification of biological control agents.

The CGIAR centers are exceptionally well placed to deploy modern molecular technologies, and to develop new varieties with greater speed and precision. Genetically altered varieties, especially those that are sensitively responsive to the specifics of complex smallholder farming systems, can be introduced to less-favored areas offering undreamt of opportunities to the poor. However, the research agenda must also address areas of concern about biotechnology. Biosafety must be ensured through appropriate scientific analysis of the types of risks these organisms might pose.

To address all these issues, what should be the distribution of responsibilities among local, national, regional, and international research? Should every country have a full-blown research system? What role should multinational firms play in the global research systems? What are truly public research goods—nationally and internationally?

In this discussion we dare not forget the farmers. Farmers were the first scientists. They carried out the first experiments, asked themselves numerous questions and, through their answers, served as creative providers. So, however high we set our sights, we should never forget that in the distilled experi-

ence of farm men, women, and children reside wisdom that has to be integrated within the new science. If we fail to do so we will have to ask ourselves, as T. S. Eliot did:

Where is the wisdom we have lost in knowledge? And where is the knowledge we have lost in information?

Research Partnerships: A New Paradigm

The choices are difficult and the tasks are complex. But science gives us the strength we need to make the choices. None of us can act alone, however.

The world's leaders declared at the World Food Conference of 1974 that "every man, woman and child has the inalienable right to be free from hunger and malnutrition." In the context of that declaration, the conference set the international community a "time limit" of a decade in which to eradicate hunger. That goal has not been met. Our failure to meet the goal we set ourselves suggests that President Kennedy was on target when he said that although we have the capacity to banish hunger from the earth, we do not have the will. Can we of the CGIAR and our partners now summon that will? I believe we can, but only if we act in concert.

National agricultural research systems must remain the cornerstone of these efforts, for they are closest to the farmers and farm families on whom agricultural science depends. NGOs are particularly important partners with advanced research institutions, and community organizations have special strengths to add to this effort. The private sector will have to undertake an increasing share of the necessary research and diffusion. Public sector financing will be needed for areas of limited interest to the private sector, such as genetic resource conservation, common property resource manage-

ment, integrated pest management, and research on subsistence crops. Enhanced support from the international community will be required for the agricultural and rural development programs of poor countries.

The CGIAR centers have a special contribution to make in the global effort. They can, while conducting cutting-edge science for the benefit of the world's poor, serve as platforms for the exchange of ideas and the development of new technologies.

The CGIAR centers have a special contribution to make in the global effort. They can, while conducting cutting-edge science for the benefit of the world's poor, serve as platforms for the exchange of ideas and the development of new technologies. Some of the older centers are unique repositories of genetic resources and of knowledge gained over many years of plant improvement. They provide exceptional platforms for the intelligent development and application of new tech-

nologies—from molecular markers for accelerated plant breeding to GIS for decision/support systems.

The Future

During ICW96 of our twenty-fifth anniversary year, we celebrate what has been. But we also ask ourselves what can be in the future. The legacy of the past is strong—and strengthening. We must find confidence in that strength to create new approaches, sharpen our focus, broaden our partnerships, and continuously renew our commitment.

Science is the foundation on which our future must be built. Yes, the tasks ahead are enormous. But let us lay that foundation with compassion and care, with full awareness that the structures we build on it will open their doors to the weak and the vulnerable, offering them hope. Their needs and their yearning for progress challenge us. We must not fail them.

TOWARD A GLOBAL AGRICULTURAL RESEARCH SYSTEM

International Centers Week: Global Forum

October 30, 1996

*T*his is a heady occasion. From the tentative first steps we took in the earliest phase of the CGIAR renewal program, we have picked up both confidence and momentum. Today we reach a high point in our onward march, assembling for a global exchange of ideas, to harmonize our aspirations and design the instrumentalities by which they will be fulfilled. We owe our special thanks to you, Mr. Chairman,¹ for your interest, both personal and institutional, in providing this movement with leadership and guidance.

Much more lies ahead: hope, excitement, effort, achievement. That we have come as far as we have in such a remarkably short time is a tribute to the passion and commitment of those engaged in creating a truly global agricultural research system. But the most daunting test of our

That we have come as far as we have in such a remarkably short time is a tribute to the passion and commitment of those engaged in creating a truly global agricultural research system. But the most daunting test of our reason and our passion lies in the effectiveness with which we end our current phase of consultation; draw on the ideas that have been expressed nationally, regionally, and internationally; and move decisively into action.

¹ Mr. Fawzi Al-Sultan, President, IFAD, Chairman of the Global Forum.

reason and our passion lies in the effectiveness with which we end our current phase of consultation; draw on the ideas that have been expressed nationally, regionally, and internationally; and move decisively into action. The problems that await the attention of the global agricultural research community are too urgent for unified attempts at their solution to be postponed for another day.

The most important challenge facing this Global Forum is that of devising both the priorities of and the modalities for action. That process—setting the face of the debate toward action—was evident on the first day of ICW96, when the need was clearly understood for research partnerships in the battles against poverty, hunger, environmental degradation, and inequity. The idea that science must permeate this process, not only in technical terms but as a motivator of societal change, lays the basis for far-reaching decisions. And the process gained both substance and momentum yesterday, when CGIAR Center Directors outlined their programs from regional perspectives. They are increasingly seeking collaborative initiatives and activities with a range of partners. Today we will hear from the NARS leaders, reflecting their work in the regional forums. From those regional perspectives we can move to a broader, global canvas.

Guiding Principles

As we progress from precept to practice, let us remind ourselves that the form of agricultural research to which we aspire is not for Southern countries alone. Still less is it something conceived of and promoted by the North for the South. It affects both the North and South. In this process it is absolutely essential to increase cooperation among all those involved: Northern countries, Southern countries, international organizations, the public and private sectors, and organizations within civil society. Meetings such as this one are im-

portant to engage decisionmakers in both national and international organizations to work with all other actors in this emerging global system of agricultural research, and to lay the basis for enhanced cooperation that should reach all the laboratories and research stations and the farthest flung research workers, and indeed the whole of the agricultural community—farmers, particularly women farmers—included.

Today research is subjected to dual pressure. On the one hand, it must take account of the diversity of natural and human environments and therefore come to terms with location-specific realities. It is equally influenced by globalization factors: the awakening of a planetary conscience against common challenges; the revolution of basic sciences, particularly in biology; the interconnection of communications networks; economic liberalization; and so on. The emergence of a “global system” is manifest. However, in this area, as in others, we must ensure that this “globalization” of research does not translate into a few powers dominating a world where the vast majority are relegated to being consumers of the “cast offs” of a few. In short, this system must be participatory, open, and inclusive, and built from the ground up. This is the only way in which diversity can be taken into account, particularly biological and cultural diversity, which give the world its beauty and offer the world opportunities for multifaceted development.

The emergence of a “global system” is manifest. This system must be participatory, open, and inclusive, and built from the ground up. Agricultural research, if it is to be relevant and realistic, must be built in collaboration with farmers and farmers’ organizations, and must be sensitive to the economic, social, and conceptual framework within which farming communities make decisions.

Farmers play a central role in this diversity. The farmer manages a system which must both produce an income and reproduce a capital, particularly a biological capital; local va-

rieties and soil fertility, for example. She is the trustee of a heritage. She is, however, limited by factors involving economic, political, and legislative imperatives, the environment, and by physical factors. Consequently, farmers make their decisions as producers in their own best interest. The farmers' adoption of new technologies is intimately linked to these realities. Agricultural research, if it is to be relevant and realistic, must, therefore, be built in collaboration with farmers and farmers' organizations, and must be sensitive to the economic, social, and conceptual framework within which farming communities make decisions. The era of research which produces technological innovations without reference to the needs of producers is over.

New synergies cannot be restricted to the farmer-scientist partnership alone. The effective use of advanced technologies requires that public research be in harmony with the private sector. In a world facing the pressure of increased population—100 million more people to feed every year—facing the specter of environmental loss, and seeing the impact of continuing inequities on the poor, there can be no room for divisiveness in the agricultural research effort. “Public assets” and “private assets” each have their own logic. These must be clearly understood, and their differences as well as their complementarities respected.

The real challenge is to ensure that all usable assets are deployed for the production of public goods. This principle applies to the protection of intellectual property and in the field of biological research. We need an overall system that promotes interaction to help each actor contribute to the best of its comparative advantages so that the whole is much more than the sum of the parts. When such a system is in place, the synergies in agricultural research will acquire their own momentum, providing more productive links among public and private actors, national and international agencies, rich and

poor countries, and formal and informal sector institutions of the civil society.

Action Points

A major challenge we face in seeking these new synergies is the possible closing up of the international regime in which the next generation of agricultural science will take place. If that should happen, there is not likely to be the same free flow of information and germplasm that we have known. That freedom allowed the CGIAR to bring the best of advanced research to bear on the problems of the very poor. Paradoxically, despite the Internet and the collaborative mapping of plant genomes, we will face more risks in the future, if there is a marked increase in patenting of process and product, especially in the area of biotechnology and transgenic plants.

There are also increasing obstacles to the movement of germplasm as national governments assert control over their genetic resources. All this could lead to a scientific apartheid where the 80 percent of humanity in the developing countries are increasingly locked out of the most recent advances of modern science. These risks may be offset by a greater flow of scientific output. Prudence, however, requires special efforts by us to make the international agricultural research system more open and integrated, and to reach special arrangements with the private sector on the use of some of the new technologies for the poorest parts of the world.

This will be quite a challenge, but without challenges, science dies.

Action can take many forms, so let me suggest just a few that could inform your discussions and lead the way to decisions on practical measures for the foreseeable future.

First, commitment to the principle of subsidiarity. Because our stated aim is the development of a *global* system, great care must be taken to ensure that participatory, bottom-up arrangements bring about public understanding of global imperatives. So programs and projects should be both planned and managed at the most local level at which they may be effectively completed. To do this well we must develop the capacity to listen better and to hear more in our relations at the local levels of operation.

Second, gather and conserve knowledge for appropriate and widespread use. Complex resource-use systems have been developed by farming communities and have worked effectively for thousands of years. This is part of the common human heritage and its loss through neglect must be reversed.

Both national and international agricultural research institutions should recognize farm organizations, community organizations, and other NGOs both as potential research partners and as sources of knowledge on societal transformation. These organizations are particularly well situated to provide guidance on the integration of women in agricultural transformation—as participants, beneficiaries, and leaders.

Third, explore the use of mechanisms that build productive linkages between farmers and researchers. Japan's system of prefecture stations—where a group of scientists in each station functions as the conduit for two-way communications between farmers and research institutes—is a model worth examining.

Fourth, both national and international agricultural research institutions should recognize farm organizations, community organizations, and other NGOs both as potential research partners and as sources of knowledge on societal transformation. These organizations are particularly well situated to provide guidance on the integration of women in agricultural transformation—as participants, beneficiaries, and leaders.

Fifth, reinforce the position of NARS as the cornerstone of the new global research system. NARS are the key to a global farmer-back-to-farmer interchange that can drive broad scientific advances in agriculture, particularly in dealing with location-specific ecological problems. Capacity building, communication, and respect are among the determinants of a stronger role for NARS, including regional associations of NARS.

Sixth, recognize that NARS include all the essential capacities to undertake agricultural research including universities and all the other actors we have been discussing. The fundamental role of the public national research institutes as the hub of this national system should be reinforced.

Seventh, provide opportunities for the private sector to share its knowledge and resources with other partners. In this connection, the initiative of the CGIAR Private Sector Committee to convene a high-level private sector meeting is most welcome. Barriers of misunderstanding need to be replaced by platforms of knowledge sharing.

Eighth, the CGIAR must see itself as an active participant in the further development of the global agricultural research system as it continues with its mission of carrying out cutting-edge research.

These action points are based on the need for partnerships. But partnerships must be based on trust and mutual confidence. These require candor, openness, and respect. So let me address a sensitive issue that I believe we must discuss openly and deal with effectively to build a more solid foundation for the future.

There appears to be an asymmetry in the current collaborations among many northern scientists and their colleagues

in the developing world. An extreme statement of the personal senior/junior status relationship is that the latter tend to be given the field work, and the former get to publish the results. That is partly the result of scientists in the North having greater access to funding for the research and closer proximity to publications of prestige. This reinforces the senior status of the Northern scientists at the expense of their colleagues in the South.

True partnerships require that collaboration be based on a more open system, where the best of the developing country scientists are given the fullest opportunity to demonstrate their abilities. They must be able to flourish without having to emigrate to the North to join an "advanced research institution." This will require an attitudinal shift in many of the advanced research organizations, to be more open and reach out, just as it will require a shift in the attitudes of the developing country institutions that need to adhere more rigorously to the norms of excellence over seniority, in recognizing the best among their scientists in their own institutions. They must also make better use of peer review and actively seek to combine timeliness and response with attention to quality.

To the members of the scientific community in the industrialized world I say: You cannot let the talents of 80 percent of humanity flourish only if they leave their native lands or delink themselves from their societies. You must extend additional efforts to reach them and assist in the strengthening of the scientific enterprise in the South. We all gain if all of humanity can contribute.

To the members of the scientific community in the developing world I say: We are at a crossroads. Either we are going to reassert the importance of science and the scientific outlook, or we are going to witness our societies increasingly marginalized in the world of the information age.

The CGIAR centers have a crucial role to play in all this. Beyond the content of their work and the manner in which they design and execute the research program with their partners, they must serve as the nexus for the exchange of information and the development of true networks of scientists between the North and the South. They must be dynamic catalysts to help the movement, already started in some places around the world, to move away from this senior/junior relationship toward one of true partnership.

Having flagged those issues, I want to salute the achievements of NARS leaders in setting up four regional associations, often regrouping effective subregional bodies with a proven track record of effective collaboration among NARS of the same region. These four associations are increasingly recognized as the legitimate, collective voice of the NARS, which we believe will be an important feature of a global system based on a more equitable distribution of power and responsibilities.

But despite my satisfaction at the long way we have come in the last few years, let me also share with you my frustration at how difficult it is to move more systematically from words to actions on the ground. Let us create a nonbureaucratic “virtual” set of institutional arrangements that will provide coherence and focus to this recurrent call for partnership. Let us not use this call as a “mantra” to be invoked as a cover for a never ending series of meetings and consultations. Let us instead translate the good intentions into a real partnership for doing concrete

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things. Let us move in many small but firm steps, each reinforcing the other. Scientists are the visionaries of action. So let us act.

Moving Ahead

The Global Forum has a heavy agenda. There is much to think about and much to decide in a relatively short time. Even heavier than this agenda is the responsibility the Forum is about to fulfill. It lies within your grasp to create a framework for synergistic effort whose results can change the lives of the weakest in society.

Circumstances offer us the opportunity and the obligation to forge a global research alliance. The revolution in molecular biology and in information technology offer us unprecedented opportunities for harnessing new resources on behalf of the poor. This cannot be achieved by any organization single-handedly. We must work together to win together.

You cannot put together all the pieces of the required response to the challenges faced by the international community. But you can, and I am sure will, mobilize your own combined resources to ensure that agricultural transformation drives change and progress across the board. Two principles are paramount if this is to be achieved: unity of purpose in a dynamic global agricultural research system; and the deployment of science as an instrument of both technical and societal change.

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Can we watch the impoverishment of an increasing part of humanity? Can we watch the planet being pillaged without reacting? Can we accept such violence against the human family?

The future is ours. We must address the questions which confront us today, consolidate the concrete responses which can be implemented immediately in our own work, and experiment with and put into practice the new methods of agricultural research which take seriously the risks that threaten the future of our planet.

We are committed to the principle of using this first Global Forum to move decisively toward:

- defining the next steps in building the linkages of the emerging global system;
- defining the priorities of the global system and the respective research agendas of its component parts; and
- defining real partnerships for action on the ground between the CGIAR and the NARS.

We will not get there in one step, but we must not lose the momentum we have achieved. This Forum was the result of much work by the NARS and the regional forums. Let us take steps to ensure that the necessary follow-up is achieved.

The world around us is changing and we must change with it. Let us dare to be bold. Let us set out together—I emphasize, together—on the road to a sustainable future. At the end of that road lies the meeting point of the village trail and the technological superhighway.

THE CGIAR IN THE GLOBAL AGRICULTURAL RESEARCH SYSTEM

International Centers Week: Business Meeting

October 31, 1996

I said at the beginning of this week's proceedings that ICW96 had been set up in a somewhat segmented way, but that, at the same time, the substance of each segment was such that seamless transitions would be possible throughout the week's programs.

That the transition from each component of ICW96 to the next has gone as smoothly as it has is a tribute to your commitment to bringing these deliberations to a productive conclusion. How else could groups representing the full spectrum of global agricultural research, coming together for the first time to define priorities and agree on how to implement them, identify such a broad area of commonality in such a short time? The strong trend toward moving from outlining areas of agreement to entering arenas of action is most welcome.

What is emerging is not simply a matter of consultation among those engaged in agricultural research, but the beginning of the coordination of all elements and an expansion of the participants to include many important actors not previously recognized as part of the formal agricultural research system.

What remains for us at this business meeting is to prepare, through our decisions here and our actions in 1997,

to re-position the CGIAR within the emerging global agricultural research system.

The Emerging Research Agenda

Let me help give some focus to our examination of the positioning of the CGIAR by stating a basic proposition. The world's core objectives of poverty reduction, food security, and sustainable natural resource management cannot be met unless rural well-being in general, and a prosperous private agriculture for small- and medium-size holders in particular,

Central to improving the productivity and profitability of agriculture are improved technology, appropriate policies, and supportive institutions. At the core of technological improvement is agricultural research, the area in which the CGIAR functions.

are nurtured and improved. Central to improving the productivity and profitability of agriculture are improved technology, appropriate policies, and supportive institutions. At the core of technological improvement is agricultural research, the area in which the CGIAR functions.

Our greatest contribution toward reaching those core goals will be research that is oriented toward the main problem areas identified. And that is precisely the research direction on which we agreed at the Jakarta Mid-Term Meeting. The priorities and strategies we endorsed had a poverty orientation, pulling together productivity-related activities and natural resources management programs that contribute to poverty alleviation. I said at the time that these priorities followed the dictum of our good friend M. S. Swaminathan that good policies are "pro-poor, pro-women, and pro-environment." We reaffirmed an emphasis on food security, the environment, the rural poor, and women, and on the need to find ways to turn these emphases into research programs.

These issues, including the many choices open to us as we seek to use cutting-edge science to serve the interest of the poor, can be the focus of the systemwide review that will be launched following ICW. For the review to guide us into the future, we need a strategic exercise in which a panel of eminent people can examine the role of the CGIAR system in meeting the research needs and challenges required to accomplish its mission and recommend improvements in how we function and how we deploy our talents and resources. It should be conducted with a broad, forward-looking perspective, covering any aspect of the system that the review panel considers important for the future effectiveness of the CGIAR, starting by positioning it *vis-à-vis* other actors.

The panel will undoubtedly take note of the rapidly changing nature of global science, communications, and institutional arrangements, and of the significance of these changes to the CGIAR. It should pay particular attention to the evolving capacities of national agricultural research systems in developing countries, NGOs, and the private sector; the comparative advantages of various actors; organization and management of research; and the strengthening of research partnerships. The panel should hear from all stakeholders and have the freedom to probe any and all parts of the system.

However, there are many issues that need early examination and which cannot be set aside until the review has been completed. We live in a changing global environment, with countless new developments taking place in the fields of biotechnology and information. We need to respond to them. Therefore, the preliminary task of examining the issues and beginning to outline a new agenda must be carried out by TAC and through the MTPs¹ in an interactive process between TAC and the centers. I expect the MTPs to be short

¹ The three-year medium-term plans of CGIAR centers, covering 1998 to 2000.

and pithy, not the encyclopedic, telephone-book type of tome some authors produce, pursuing a spurious accuracy, in the hope that it will serve as a security blanket.

We live in a changing global environment, with countless new developments taking place in the fields of biotechnology and information. We need to respond to them. Therefore, the preliminary task of examining the issues and beginning to outline a new agenda must be carried out in an interactive process.

The efforts spearheaded by TAC are not meant to preempt and will not preempt answers to the same questions provided by the systemwide review. The agenda that emerges from TAC's assessments and from its interactions with the centers will need to be set against a series of macro issues that can be understood in terms of competing shares of a finite set of resources for agricultural research, underlining that it is not a question of either/or but of how much for each. Let me review some of these issues.

First, favored versus less-favored areas. I believe we are past treating this as an either/or choice. But the question then becomes how much of each in a period of finite resources. How does one weight poverty reduction for poor subsistence farmers against low food prices for the rural landless and the urban poor? How does one focus on the particular target groups we want to help—the poorest, women, and those who cultivate fragile environments?

Second, traditional versus exotic crops. The Sahel is one of the most difficult environments in the world. How can we improve the productivity and the income potential of these poor farmers? Should we invest in improving the yields of indigenous crops—millet and sorghum—or should we try to improve the stress resistance of higher-yielding nontraditional maize? Should we invest in developing “tropical” wheat or potatoes, or improve yams, sweet potatoes, and cassava?

Third, time horizon choices. What should be the time frame of expected impact? Often, improved agronomic practices such as spacing, seeding time, weed control, and planting depth can have short-term yield impacts, whereas genetic improvement, particularly involving complex characteristics, takes much longer but has higher long-run yield potential. How much should the international system invest in small, incremental improvements (including removing impediments to application of known technologies) *versus* the development of radical new technologies, such as transgenic techniques for apomixis and plant resistance, for the poor?

Fourth, environmental improvement versus yield maximization. Frequently this is posed as a major tradeoff in priority choice, but it cannot persist as such. Clearly a major challenge to agricultural science is to turn this apparent win-lose situation into a win-win situation.

Fifth, the integration of traditional knowledge and new science. The documentation of traditional knowledge, including identification of wild races, should be undertaken before it is lost. It must be integrated in a two-way commerce of ideas with modern science, and the poor farmers who are the custodians of this knowledge should benefit from these efforts. How much of the available resources should be directed toward that type of effort?

Sixth, the search for integrated farming practices that reflect local specificities versus the search for new technologies with very broad applications. Such farming practices would reduce the vulnerability of the smallholder farmer and/or increase her or his income. These re-

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quire international reach, but local adaptation, such as the introduction of multipurpose leguminous trees like sesbania or calliandra, or the introduction of fish ponds for super tilapia, which turn out to help with on-farm water management in addition to producing fish. How much attention should be given these types of activities versus the use of cutting-edge technologies such as transgenic biotechnology to attack the problems of the developing world?

Key Considerations

Whatever the outcome of the exercises by the centers and TAC, there are a few central issues that must be addressed effectively and immediately.

As many speakers have stressed this week, there are great opportunities in the area of *biotechnology*. The opportunities for producing transgenic varieties are endless. Plants and animals that use water more efficiently, grow in highly adverse conditions, resist pests and diseases, and use fewer inputs have enormous potential to contribute to sustainability of agricultural production systems and are representative of the range of possibilities which may develop through biotechnology. Biotechnology also has great potential in livestock and fish production, and in the modification of biological control agents. The CGIAR centers are exceptionally well placed to deploy modern molecular technologies to develop new varieties with greater speed and precision.

It would be folly to erode the capacity of the older centers that are the core of the CGIAR's experience and expertise to undertake these tasks. They have in recent months suffered the pain of reduced funding, causing them to lose staff and to adjust, if not discontinue, some programs. This, despite the fact that overall funding for the agreed research agenda has increased. These centers need to reposition themselves to play

an even stronger partnership role with others in the global agricultural research system and in doing so to present their strengths and emphases to the donor community more actively than before. Members, for their part, should not be guided by misperceptions of what these centers are doing and can do. The current situation is sapping the morale of scientists, causing instability in the affected centers and damaging the integrity of research. This should not be allowed to continue.

At the same time, we must address many other issues that must be reflected in the mandates for the MTPs and TAC's influence on the 1998 research agenda. There is, for instance, a whole range of *databases* to be built up. We already have the beginnings of a Water Atlas. I hope we will soon be able to create land use and land quality databases. A paper prepared by the World Resources Institute and the World Bank on this topic is available. We need to pursue taxonomic databases that are essential for a rigorous application of scientific principles. We need to lay the foundations for informed debate and information sharing. Even our outreach programs must be viewed in this context, not as the exhibitionism of public relations, but as a part of science.

New opportunities lie ahead of us in *Eastern Europe and Central Asia*. The *Lucerne Action Program* set clear preconditions for possible CGIAR programs in that region. Two of them have been met: the existence of a potential work program and the CGIAR's comparative advantage to undertake that work. This is the conclusion of the task force we established to examine the issues. We can accept the excellent re-

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port of the task force, and prepare to launch a work program when the third precondition laid down in Lucerne has been met: the availability of truly additional funding.

We need to deal with post-Leipzig *plant genetic resources* issues, keeping them under constant review. Many issues and views are at play here, and we are guided in dealing with them by the advice of the special committee we have established to examine matters dispassionately. We should take a pragmatic stance in this area as well, remembering that these issues stir up powerful ideological passions. We must continue our constructive engagement with other actors in helping shape the evolving world order to deal with genetic resources.

Another pressing concern is to ensure that the needed follow-up to the Global Forum does, in fact, take place. A great deal of preparation preceded the Global Forum, and one advantage of the planning process is that it resulted in the emergence of strong regional associations of NARS. Now all of us must live up to the inspiring words of the *Declaration* adopted by the Forum. We must move forward, remembering that it will take a major combined effort of many forces to deal with the food security-related problems that cry out for resolution.

All of these issues are complex. But the existence of difficulties is not an excuse to avoid action. Too much is at stake in terms of human progress, too much interest has been aroused, too many expectations have been stirred, for us to shy away from confronting these issues.

Finance

You may rightly ask what is the funding situation in 1996 and 1997? Let me reassure you that despite the problems

encountered during the Mid-Term Meeting in Jakarta, the program for 1996 is fully funded at \$300 million. This was thanks to exceptional efforts by a number of members, especially Denmark, which came forth with additional money in 1996.

The situation for 1997 seems promising. The prospects look good that we could have a fully funded slightly larger agenda next year.

Let me brief you about the process that was followed after the Jakarta meeting.

We had adopted a tentative agenda of around \$300 million in Jakarta. We refused to expand the envelope given the difficult experiences just encountered and the pain still being felt by some of the older centers that were particularly hard hit by the shortfalls and only partially compensated by the additional funds, since the Jakarta situation involved realignments between centers and total allocations. We then made different decisions on process. The agenda having been approved, the centers were encouraged to proceed with their full entrepreneurial talents to secure all the funding they could for the agreed research agenda. The “envelopes” were now to be considered as “indicative targets” rather than “envelopes.” The centers would be allowed to exceed them. They would not lose World Bank funding for having secured substantial funding for their mandated agenda items. Indeed the World Bank funding would be proportional to the amount they secured subject to three caveats:

1. The content of the proposals that they brought was to be certified by TAC prior to International Centers Week as being acceptable.

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2. Some of the centers that had been relying to a very large extent on World Bank funding would receive transitional, one-time support in 1997, with the expectation that in 1998 all centers would be treated the same.
 3. TAC would also advise the Finance Committee about the question of relative priorities emerging with respect to protecting the integrity of the agenda.

The procedures worked very well. The result appears to be satisfactory, except for the continued shortfalls in some of the older centers, and this has prompted my impassioned plea to you all not to allow the erosion of the capacities of these centers of excellence that are uniquely well positioned to help the CGIAR play an effective role in the rapidly changing world of the biotechnology revolution and the management of genetic materials. Once again I urge the members to address this problem so that we may give the scientists at these centers of excellence the peace of mind necessary to be creative and forward looking.

Finally, let me say a word about the World Bank's contribution. Warren Baum² has reminded us of the early decision of Robert McNamara, when he was the Bank's President, to keep the contribution at 10 percent. You heard how it got raised to 15 percent up to a maximum of \$40 million during the tenure of his successors. The Bank then stepped in during the period of crisis and increased its contribution to some \$100 million for 1994 and 1995, not counting the contributions to the Secretariat and TAC and a forgiven loan. Following the stabilization program that was undertaken in 1994, the Bank did not go back to \$40 million but stayed at 15 percent, which was equivalent to \$45 million in 1996.

² A past CGIAR Chairman.

The Bank has decided to maintain its contribution at the current \$45 million plus Secretariat expenses—firm and untied. It is hoped that this will be accompanied by a continuing increase by the other members, and by the diversification of the financing base to arrive at a gradual reduction of the percentage of the Bank's contribution in the years ahead. But the firmness of the commitment and its untied character serve as a glue that helps to maintain the integrity and predictability of the system.

Envoi

The opening line of a well-known American song says, simply: "It was a very good year."

For the international community 1971 was, undoubtedly, a "very good year," when the decisions made earlier at Bellagio reached fruition in Washington with the formal establishment of the CGIAR.

In the intervening years, the CGIAR has proved itself many times over. But effective institutions cannot be satisfied with the *status quo*. They have a creative energy that needs periodically to be replenished and unleashed. Replenishment comes from within, then moves outward.

The CGIAR sought and secured that inward replenishment in its program of renewal. At ICW96 we have sought to move outward, opening ourselves to new partnerships, new influences, and a whole new way of doing business.

Effective institutions cannot be satisfied with the *status quo*. They have a creative energy that needs periodically to be replenished and unleashed. Replenishment comes from within, then moves outward. The CGIAR sought and secured that inward replenishment in its program of renewal. At ICW96 we have sought to move outward, opening ourselves to new partnerships, new influences, and a whole new way of doing business.

Today, we look back at the visionaries of Bellagio and marvel at their foresight. I am confident that twenty-five years from now our successors will look back at Washington '96 and treat it as a watershed event in the application of science to the needs of the poor. For here we have combined the intellect and compassion of every component of the global agricultural research system in a single, pervasive commitment: a revolution of science in the service of those who cannot live without it.

A SUMMATION

International Centers Week: Closing Session

November 1, 1996

*W*e have reached the end of another Centers Week. Now the time has come to distill our thoughts into a basis for action, and to move on from these exciting days of intellectual exploration to the everyday battles of our lives.

We have had a rich dialogue. Our deliberations have been characterized by substance and have been imbued with passion. We have experienced and manifested diversity as few other international meetings have. We have looked at past achievements and future prospects with equal enthusiasm. We were greatly privileged to have some of our predecessors with us. We honored them as we honored those who could not join us. We showed the same respect for younger colleagues who will be the standard-bearers of the CGIAR, facing a challenging future. We especially honored colleagues whose scientific achievements directly improve the lives of millions of poor people. In doing so we complemented the international recognition they have received. We bade farewell to some colleagues, and looked forward to welcoming others. We moved into new partnerships whose strength and richness offer exciting possibilities for the future. All

We have had a rich dialogue. Our deliberations have been characterized by substance and have been imbued with passion. We have looked at past achievements and future prospects with equal enthusiasm. We moved into new partnerships whose strength and richness offer exciting possibilities for the future. All these are signs of a vital and living institution; one that is changing, evolving, and growing.

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What remains is for me to present you with the Chairman's final summation. This is now as much a tradition at CGIAR meetings as is the Chairman's opening policy statement. However, because this year's ICW has been very different in content, style, and character from its predecessors, I intend to break with tradition to some extent. Rather than go through every item on the agenda of each of the four components of Centers Week, I will revisit the major themes that emerged from our week of meetings and reaffirm their significance. So let me review the highlights of our meeting.

Agriculture and Development. Agriculture has been rediscovered and is once again positioned at the heart of the development paradigm. We had confirmation of that from both Bank President James Wolfensohn and Maurice Strong, whose duties now stretch from the Earth Council to the World Bank to the United Nations. These affirmations are important contributions to the global development debate, with a special significance for us. The congruence of interests between the international development community, overall, and ourselves, is manifest. We are obliged to define and redefine the best ways of turning that conceptual congruence into living reality. This will be particularly important as we move into the World Food Summit in Rome which, I believe, will reorient the global development debate.

Quality of Science. The accumulated experience of the CGIAR system and its capacity to mobilize high scientific skills is universally known and honored both within and outside the CGIAR system. The fact that six out of ten World Food Prize laureates are connected with the CGIAR makes the point eloquently, as does the presentation of the King Baudouin Award to center scientists who "improved the unimprovable"—pearl millet.

The tradition of scientific excellence is being maintained by a new generation of center scientists on whom future hopes depend. They are particularly well positioned, given their skills and enthusiasm, to be in the vanguard of the scientific revolution that I described in my policy statements this week. But science, I repeat, is not simply a matter of technical change; it is and must continue to be an instrument of societal transformation. The values that make science possible must permeate society.

Application of Science. The presentations made by Center Directors demonstrated that the main thrusts of CGIAR research are being creatively approached. To address the multiple challenges of increasing food availability, maintaining or enhancing the quality of the environment, including preserving biodiversity, while empowering the poor to take charge of their own destinies, centers are diversifying their research strategies and forging new partnerships. Current research includes advanced techniques in genetic engineering, novel work with farmers' landraces, and traditional methods of germplasm enhancement, with an increasing emphasis on participatory approaches involving farmers in the research process. We must reinforce the centers' capacity to continue and expand their research programs. We must make their work possible.

The presentations made by Center Directors demonstrated that the main thrusts of CGIAR research are being creatively approached. Centers are diversifying their research strategies and forging new partnerships. We must reinforce the centers' capacity to continue and expand their research programs. We must make their work possible.

Global Cooperation. The ideas of global cooperation inspired by the CGIAR have been taking hold in many areas, as seen in the establishment of a Consultative Group to Assist the Poorest and the launching in 1996 of the Global Water Partnership and the World Water Council. In that context, the

ICW96 Global Forum and its endorsement of a *Declaration for Global Partnership in Agricultural Research* represented a great step forward in research cooperation. This was the first time that all actors engaged in agricultural research met around the same table and carried out a constructive dialogue. What came out of that dialogue is not simply better consultation among those engaged in agricultural research, but the beginning of the coordination of all elements, including many important actors not previously recognized as part of the formal agricultural research system. The real test of the effectiveness of the dialogue will be the ability of participants to translate the vision of their *Declaration* into concrete actions.

Partnerships. The partnerships pursued by the CGIAR in response to the recommendations from Lucerne¹ are strong and growing stronger. Our partners are now represented at almost every level of the CGIAR, including the stakeholder groups. Their influence on decision making is pervasive. Our two partnership committees are fully established. The NGO Committee is now over a year old, and is in the process of reconstituting itself. The committee's planned programs of action include collaborative research and a continuing attempt to devise the most effective means for cooperation between farming communities and CGIAR scientists. The Private Sector Committee is fully operational as well and seeks to meld its interests with those of the centers. A planned high-level private sector meeting will map out some of the areas—including biotechnology and information technology—in which greater cooperation could be developed.

Research Agenda. As the guardian of scientific excellence in the CGIAR system, TAC is expected to forge a new research agenda for 1998, through its own inquiries and through

¹ The *Declaration and Action Program* adopted by the CGIAR Ministerial-Level Meeting, Lucerne, Switzerland, February 1995.

the MTPs in an interactive process between TAC and the centers. This agenda will need to take into account the challenges and opportunities inherent in biotechnology developments, the need for database creation, plant genetic resources issues, and the agricultural potential of Eastern Europe and Central Asia. Two of three preconditions laid down at Lucerne for CGIAR activity in Eastern Europe and Central Asia—the existence of a work program and comparative advantage—have been fulfilled. I am confident that the third, true additionality in funding, will be fulfilled soon.

Finance. New financing arrangements which encourage entrepreneurship by the centers were introduced at the Jakarta Mid-Term Meeting and are working well. The research agenda was funded at some \$300 million in 1996. The anticipated figure for 1997 is in the region of \$325 million. Extraordinary efforts by a number of donor members have contributed to this robust state of funding. Yet some centers have not benefited from this trend. Unfortunately, the greatest pain is felt by some of the older centers that are exceptionally well placed to deploy modern molecular technologies to develop new varieties with greater speed and precision. This trend should be reversed.

Systemwide Review. We are agreed that as we seek to choose between options, build up our capacity, strengthen our partnerships, and improve our effectiveness, we could benefit from a systemwide review. This would be a strategic review, looking at future needs, emphasizing the use of science as a means of societal transformation, and helping us to position the CGIAR in the emerging global agricultural research system. We are agreed, too, that members of the review panel should be of the highest caliber; we will have a stellar panel. They should hear from all stakeholders and have the freedom to examine the workings of any aspect of the CGIAR system they wish. This will enable them to provide

us with guidance on positioning ourselves in the global system. The review will be launched as soon as a high-level panel has been constituted.

As we leave ICW96, having achieved a powerful integration of ideas, let us remember that whether we are separated by institutional barriers, distance, time, or resources, we are one in our concern for the world's disadvantaged.

Hunger, extreme poverty, and their environmental consequences in a world that has the means to feed its people are unconscionable and unacceptable. The coexistence of opulence and cruel poverty is obscene. We must carry out the struggle against hunger, poverty, environmental degradation, and cultural marginalization with single-minded devotion.

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With that goal and that commitment we can ensure that our words will ring through into the daily lives of the wretched and the forlorn. We can offer them what often eludes them but can always sustain them—hope. The poor cannot survive on hope alone, but without hope they have nothing to live for. Hope deferred ... is hope denied. And we must provide them with means to fulfill their hopes; to turn their yearnings into accomplished fact.

I look forward to welcoming you in Cairo next year. And, again, thank you, one and all.

ABOUT THE AUTHOR

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