06 ANNUAL REPORT

Focus on Partnerships FOR Effective Research

CGIAR

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From a dozen founding Members in 1971, the Consultative Group on International Agricultural Research (CGIAR) has grown to 64 Members, including 25 industrialized countries, 22 developing countries, 5 private foundations and 12 regional and international organizations. These 64 Members provide the human, technical, intellectual and financial resources that underpin the CGIAR's global partnerships forged to improve agriculture and natural resource management in the developing world.

In countries that directly benefit from CGIAR activities, government agencies, civil society organizations, private sector players and farmers' groups work with CGIAR scientists to combat poverty, hunger and environmental degradation.

This report celebrates the partnerships through which demand-driven research is conducted to mold discoveries made in the laboratory and the field into international public goods. These public goods are the tools with which regional, national and local organizations — as well as individual farm families — help to foster economic growth and build more sustainable livelihoods for all.

Millions of people worldwide benefit directly from CGIAR innovations and interventions, while thousands have a hand in producing the international public goods from which these benefits derive. But the process begins with the contributions of the few, the 64 Members of the CGIAR.

PHOTOGRAPHY CREDITS

Front Cover: WARDA (Rama Venkatraman) ● Flap: CIAT ● P2: IRRI (Adam Barclay)
P3: CGIAR ● P4: Panos Pictures (Mikkel Ostergaard) ● P7: IWMI (Sharni Jayawardena)
P8: Bioversity (Michael Hermann) ● P9: CGIAR ● P10: Top: Panos Pictures (Crispin Hughes),
Bottom: Minden Pictures (Michael & Patricia Fogden), Inset: ILRI ● P11: FAO, Inset: IWMI
P12: World Bank, Inset: Istock Photo ● P13: DRC (Dhed'a Djailo) ● P14: World Bank ● P15: IRRI
P17: Top to bottom: (1) CIP (Maria Elena), (2) ILRI (Romney), (3) ICARDA (Majeb Khatib),
(4) Bioversity (Jeremy Cherfas), (5) IITA (Nelson Abila) ● P18: Top to bottom: (1) World Bank,
(2) ILRI (Stevie Mann), (3) Minden Pictures (Michael & Patricia Fogden), (4) IRRI,
(5) World Bank, (6) World Bank ● P19: CGIAR ● P21: Top: Panos Pictures (Jan Banning),
Bottom: IRRI (Ariel Javellana), Inset: IRRI ● P22: WARDA ● P23: Bioversity
P24: CIAT ● P25: CIFOR ● P26: CIMMYT ● P27: CIP ● P28: ICARDA ● P29: ICRISAT
P30: IFPRI ● P31: IITA ● P32: ILRI ● P33: IRRI ● P34: IWMI ● P35: World Agroforestry
P36: WorldFish Centre ● P37: top: Panos Pictures (Marcus Rose), Bottom: CIP,
Inset: ILRI (Maria George) ● P38: CGIAR ● P39: CGIAR ● P40: GCP (Peter Fredenburg)
P41: HarvestPlus ● P42: World Bank ● P43: SSA-CP ● P49: CGIAR
P51: Top: CIP (Maria Elena), Bottom: CIP, Inset: ILRI ● P62: Top: CIAT (Ramirez),
Bottom: World Bank, Inset: World Bank ● Inside back cover: WARDA (Boubakary Cisse)
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Table of Contents

CGIAR at a Glance: Working Together

The Consultative Group on International Agricultural Research (CGIAR), established in 1971, is a strategic partnership of countries, international and regional organizations, and private foundations supporting the work of 15 international Centers. In collaboration with national agricultural research systems, civil society and the private sector, the CGIAR fosters sustainable agricultural growth by applying high-quality science to benefit the poor through stronger food security, better human nutrition and health, higher incomes, and improved management of natural resources. In 2006, CGIAR Members contributed US$429 million — the world's single largest investment in generating public goods for the benefit of poor agricultural communities.

The CGIAR has five areas of focus:

5

- SUSTAINABLE PRODUCTION of crops, livestock, fisheries, forests and natural resources;
- ENHANCING NATIONAL AGRICULTURAL RESEARCH SYSTEMS through joint research, policy support, training and knowledge sharing;
- GERMPLASM IMPROVEMENT for priority crops, livestock, trees and fish;
- GERMPLASM COLLECTION, CHARACTERIZATION AND CONSERVATION, as the genetic resources that the CGIAR holds in public trust, and makes available to all, include some of the world's largest genebanks; and
- POLICY RESEARCH on matters that have a major impact on agriculture, food, health, disseminating new technologies, and managing and conserving natural resources.

Message from the Chair and Director – Power of Partnerships: Strength Through Renewal

Six years into its reform program, the Consultative Group at the heart of international agricultural research focuses on its many links with the scientific community, civil society, policymakers and the private sector

Partnerships for development — when they are genuine, coherent and focused — strengthen the partners involved, as well as their impact. This understanding of the power of partnerships drove the redesign of the CGIAR that commenced in 2001.

The changes were many and far-reaching. The Executive Council was restructured to enable shareholders and stakeholders to join together in energizing the decision-making processes. The Science Council came into being with a mandate to reach out to partners in the global science community and bring their collective wisdom to bear on CGIAR-supported research. A key objective of the new Challenge Programs was to offer additional opportunities for partnerships across the CGIAR System and beyond, with civil society organizations (CSOs), scientists, policymakers, nontraditional donors and the private sector. The CGIAR virtual System Office created a more effective partnership among the CGIAR System's service units.

Increasingly, in the years following the launch of the reform program, the significance of partnerships took hold as central to the way in which the CGIAR functioned, and new opportunities opened up for the CGIAR System to collaborate more closely and effectively than before with civil society. Linkages were enhanced with the private sector, too, through the CGIAR Private Sector Committee, which served as a conduit for a continuing exchange of ideas and experience, and as an instrument for developing innovative programs such as staff exchanges and knowledge sharing on research management.

With the reform program now in its sixth year, the effectiveness of research partnerships is the focus of this *CGIAR Annual Report 2006*. Reports from the Centers describe different kinds of partnerships among farmers, across regions, and between the private sector and CSOs — all, of course, involving CGIAR Centers. Each of these reports demonstrates the effectiveness of, and therefore the need for, partnerships as CGIAR Centers seek to continue building on the guiding principles of the reform program: efficiency, efficacy, transparency, accountability and participation.

CGIAR Chair Katherine Sierra and Director Francisco Reifschneider.

A specific aspect of partnerships was a highlight of the 2006 Annual General Meeting (AGM06), at which the Stakeholder Meeting segment took the form of a Civil Society-CGIAR Forum that reconfirmed the commitment of the CGIAR System to practical and effective forms of cooperation with CSOs. About 100 representatives of CSOs attended the forum, together with CGIAR Members, Center scientists and others. Its purpose was to review the state of relations between CSOs and the CGIAR, to assess strengths and weaknesses, and to plan for future collaboration that would enable CSOs and the CGIAR to work in harmony and so enhance their beneficial impacts on the lives of the poor, natural resource management and economic growth. A representative advisory group provided critical inputs to the CGIAR Secretariat over the several months that it planned and organized the forum. Preceding the forum was an online virtual conversation that ran for around 4 weeks. Over 150 people took part in this conversation, which enabled potential participants in the forum to exchange points of view beforehand, thereby creating for the forum a foundation of mutual understanding derived from shared interests. Another important feature of the forum was its accompanying Innovation Marketplace, which showcased some 50 existing CSO-CGIAR partnerships. In another first, conclusions reached at the forum were presented to the AGM Business Meeting.

These developments are heartening, but the somewhat rocky relations between the CGIAR and CSOs in the past allow no room for euphoria.

Although the CGIAR and CSOs have always shared compatible interests, periodic tensions have surfaced, and harmonization of effort has proved elusive. Nevertheless, the CGIAR and CSOs maintained mutual contacts and engaged in consultations on matters of common interest such as ensuring universal access to plant genetic resources, the impact of modern agriculture on the environment, intellectual property rights and international agreements that aim to protect the earth's biodiversity. Joint positions were formulated on some issues. Collaboration was evident at the practical or working level as well, as a survey identified hundreds of CSO-Center partnerships. Significant support for continued collaboration emerged at the CGIAR ministerial-level meeting held in Lucerne, Switzerland, in 1995. The Lucerne Declaration and Action Program urged the CGIAR "to convene a committee of nongovernmental organizations and a committee of the private sector as a means of improving dialogue among the CGIAR, the private sector, and members of civil society who are interested in the same issues as the CGIAR."

The upshots were the NGO Committee, the Private Sector Committee and a short-lived committee involving international science bodies. The NGO Committee fell dormant after some years and, in line with the findings of an external panel that reviewed CGIAR relationships with its partners, the Group decided to develop alternative models of CSO-CGIAR collaboration. A key feature of this new effort was its grounding on a strategic framework that defined the principles of engagement as "giving voice to civil society stakeholders within the CGIAR to strengthen mutual learning and to enable the CGIAR to better shape its research agenda and implementation for the benefit of the poor."

The strategic framework declared that the overall goals of CGIAR engagement with CSOs were to

- improve research effectiveness and impact for development,
- bring innovative ideas and new perspectives to CGIAR research challenges, and
- exemplify public accountability and transparency through global public fora.

Within that framework, CSOs and the CGIAR have explored the means of collaborating at different levels and in creative ways. (For the full text of the strategic framework paper, please see www.cgiar.org/csos/strategy_cso_cgiar_2007.pdf.) Following the Civil Society-CGIAR Forum, the CGIAR launched a competitive grants program to support innovative projects involving civil society partners and other stakeholders, promote partnerships between the CGIAR and CSOs, and create new avenues by which a growing network of CSO and CGIAR partners could continue to learn from one another by actively sharing knowledge. Over 150 concept notes were submitted, and grant agreements for the most promising four or five partnerships are expected to be signed in October 2007.

Many other avenues for partnerships with CSOs are being explored, including the creation of an

Internet portal and a site for interactive blogging. These activities make the most of a period of transition through which the CSO-CGIAR relationship can grow into a powerful instrument of research for development. This is part of a broader transition that took place in the CGIAR in the year under review, which was a year of transition for the CGIAR System itself. CGIAR Chair Ian Johnson (UK) ended his term in April 2006 and was succeeded in September by Katherine Sierra (USA). CGIAR Director Francisco J.B. Reifschneider (Brazil) prepared to leave office after more than 6 years, in the interest of creating space for renewal. The next director, Ren Wang (China), will assume office in mid-2007. Per Pinstrup-Andersen (Denmark), the first chair of the Science Council, ended his 3-year term and was succeeded by Rudy Rabbinge (Netherlands).

Meanwhile, for the first time in the history of the CGIAR, Members participated in a symposium on measures to ensure that approved System priorities are fully funded. This was followed — again, for the first time — by a symposium on alignment.

As these events unfold, CSO-CGIAR partnerships will continue to grow in strength, bringing the power of new perspectives and new approaches to research for development into the CGIAR. We are confident that enhanced engagement with CSOs will enable the voice of the South to be heard more strongly than ever throughout the CGIAR System, with a positive impact on all the work we do.

Katherine Sierra
CGIAR Chair

Francisco J.B. Reifschneider
CGIAR Director

Science Council: The Past Is Prologue

To improve the options for scientific and technological collaboration available to the CGIAR, the Science Council's Standing Panel on Mobilizing Science has commissioned a study on CGIAR Centers' partnerships with civil society organizations (CSOs). The results of the study are scheduled to be delivered in August 2007. They are expected to contribute to the CGIAR's renewed efforts to put CSO engagement in the mainstream of CGIAR processes, from setting the agenda and planning and implementing research, to evaluating the CGIAR's impact on food security, welfare and development in rural communities.

The study is expected to establish a foundation for Centers' decision-making concerning present and future partnerships with CSOs. It will be based on six case studies of Centers' ongoing partnerships with CSOs that focus on agricultural science and technology. Case studies were selected with the aim of achieving a balance between partners that are nongovernmental organizations on the one hand and farmer organizations on the other. A balance was also sought between partnerships focusing on upstream research and those engaged in the delivery of Centers' outputs.

Demand for a study on CGIAR Centers' partnerships with CSOs originated in a special ministerial meeting in February 1995 in Lucerne, Switzerland. At the meeting, mutually beneficial linkages between the CGIAR and civil society were formally recognized as being critical imperatives to a fully effective CGIAR System. Furthermore, results from a CGIAR Center collaboration survey completed in 2005 suggest that, although roughly 560 of Centers' collaborators (17%) are CSOs, Centers rarely mention these collaborations as being highly relevant. The study aims to shed light on this paradox and, ultimately, to contribute to improving the relevance and success of partnerships between CGIAR Centers and CSOs. It will document the experiences provided by Center-CSO partnerships, including CSOs' points of view, and highlight how and why these partnerships are important for mobilizing science and fulfilling the CGIAR mandate. In addition, it will identify and disseminate the lessons learned from these partnership experiences and attempt to arrive at a better understanding of the factors behind successes and failures.

The study is expected to help bring about the development of a CGIAR policy to strengthen impact and relations with CSOs and ultimately to guide the evolution of ways of working in the CGIAR.

Priorities and strategies. Following the endorsement in 2005 of CGIAR System research priorities focusing on problems for which the CGIAR is likely to have the greatest impact, the attention of the Science Council turned in 2006 to aligning the research portfolio to implement these priorities within 3 years. In addition, the Science Council has been involved in strategic studies to, for example, develop a strategy for genomics research in the CGIAR, define opportunities for handling intellectual property in regard to international public goods, and clarify the relationship of ethics and CGIAR research.

Monitoring and evaluation (M&E). Following the new approach to make the M&E of CGIAR Centers more streamlined and cost-effective, several external reviews were completed in 2006. These include a follow-up review of the recent external program and management review (EPMR) of the International Maize and Wheat Improvement Center and the finalization of EPMRs of the Center for International Forestry Research, International Center for Agricultural Research in the Dry Areas, International Livestock Research Institute, International Water Management Institute, World Agroforestry Centre and WorldFish Center. EPMRs of the Africa Rice Center, International Center for Tropical Agriculture, International Institute of Tropical Agriculture and International Potato Center were commissioned in 2006 for implementation in 2007, as were external reviews for the Challenge Program on Water and Food and the HarvestPlus Challenge Program.

A review and impact assessment of training activities in the CGIAR was completed early in 2006. The study analyzed training information and data for the period 1990-2004; interviewed stakeholders and Center staff in three regions; surveyed ex-trainees, CGIAR researchers and research partners; and included a summary analysis of evaluations and impact assessment conducted by the Centers themselves. One key finding was that, although the shift to project funding has diminished the longer-term commitment to formal training in Centers, collaborative research has brought an increase in capacity strengthening. Some Centers increased the number of short-term training events, including those targeting farmers. The training has in general been high quality and, judging by the perceptions of stakeholders, effective — but how much so depends on the strength of the national agricultural research systems (NARS) involved.

The report found that many Centers had no central node for coordinating training and that compiling

A study on research Centers' partnership experiences with civil society organizations aims to point the way toward expanded and more effective links

and accessing data was difficult. This limited the use of past experiences to design future activities. The findings of the report were consistent with the approach to training outlined in the CGIAR System priorities (mainly as capacity building within the research priorities), but it cautioned on the need for a mechanism to coordinate training within each Center. A key recommendation was that training should be formally and fully recognized as an indispensable component of CGIAR activities, both for strengthening NARS and for contributing to the execution of Center research. An important recommendation to Centers is that they increase inter-Center coordination and cooperation.

Impact assessment. A study of the impacts of CGIAR and partner research in sub-Saharan Africa was completed in 2006. Using meta-analysis to quantify aggregate economic benefits, the report finds total investments by the CGIAR and partners justified under a wide range of assumptions, provided that benefits continue at their reported levels beyond 2004. The aggregate benefit-cost ratios under this scenario range between 1.12 and 1.64. Including only benefits reported up to 2004, the ratio falls below unity in one conservative scenario in which only "substantially demonstrated" benefits are counted. Under all scenarios, the vast majority of documented benefits stem from a limited range of activities, mostly biological control and, to a lesser extent, crop genetic improvement. The report shows that documented benefits well exceed total agricultural R&D investments in the region, but significant scope remains to document them better.

Rudy Rabbinge
Science Council Chair

Center Alliance: Gaining Depth

The 15 research Centers supported by the CGIAR ratified in April 2006 the Alliance Principles and Procedures, which include mechanisms for conflict resolution. Ratification was a watershed because decisions made by the Alliance of the CGIAR Centers are binding for all members.

The formal bodies of the Alliance are the Alliance Board, Alliance Executive, Alliance Deputy Executive (Science), Alliance Deputy Executive (Finance) and Alliance Office, the last of which is the facilitating agent for the work of the Alliance. The chairs of each body are elected by their constituency according to a transparent process. The chief alliance officer is based at the International Fund for Agricultural Development headquarters in Rome. The geographically dispersed Alliance Office functions by virtual means. Individual Alliance Office staff members are hired through an international or national search process and managed by their home Center on behalf of the Alliance. As each Center is a member of the Alliance, all Center staff members contributing to collective action among the Centers are also members of the Alliance.

Several specific accomplishments were achieved in 2006.

The regional plans for collective action in sub-Saharan Africa are now essentially developed, and the Alliance is discussing implementation mechanisms. The Executive Council of the CGIAR approved the Alliance proposal that it provide oversight through the Alliance Executive (and the Alliance Board, in cases of conflict) to the plans and their implementation both in West and Central Africa and in East and Southern Africa. Alliance governance of regional plans has the advantage of holding transaction costs down by administering work with existing bodies instead of creating new structures.

The Alliance unanimously decided to submit a coherent and coordinated set of proposals in answer to the CGIAR call for proposals for new Challenge Programs. This was a departure from history and what happened with the first call for proposals for Challenge Programs. A coordinated set of proposals builds scientific synergies where needed and thereby improves the quality and relevance of the proposals.

The Alliance continued to work with the Science Council on the improvement of performance indicators. It contributed to ongoing thinking on the funding of the priorities by providing a paper that analyzed the gaps and overlaps in Center activities for four of the System priorities. The paper was used as an input to the work of the Ad-Hoc Committee on Funding the Priorities.

All Centers with genebanks signed agreements with the Food and Agriculture Organization of the United Nations, which acted for the governing body of the International Treaty for Plant Genetic Resources for Food and Agriculture. This puts the collections held in trust by the Centers — over 600,000 accessions of crop, forage and agroforestry genetic resources — at the heart of the treaty's multilateral system for germplasm access and benefit-sharing. And it positions the Centers to play a central role in implementing the treaty and developing a global conservation system (see page 15).

Following the first phase of upgrading the in-trust collections, supported by the World Bank, the Systemwide Genetic Resources Program obtained approval for a second phase requiring an investment of US$10.5 million. This supports further upgrading at the 11 Centers that hold large plant collections in trust, combined with collective action to integrate and share standards and

The ratification of principles and procedures is among several recent accomplishments of the newly formulated Alliance of CGIAR Centers

The Alliance Board and Alliance Executive meet at International Center for Tropical Agriculture headquarters, Cali, Colombia.

methodologies, thereby improving Systemwide efficiency and effectiveness.

The 15 Centers have recently decided, through their Alliance Executive, to develop a large research program on climate change, agriculture and food security in collaboration with the global environmental change community. The chairs and directors of the four international global environmental change programs* and their joint projects have likewise formally approved the preparation of a collaborative research program with the Alliance. In joint discussions, scientific plans are being finalized for each of the research priority areas identified, and a joint fund-raising strategy is under development.

In follow up to the stripe review commissioned by the Alliance in 2005, the Centers are pleased to report that they all have internal controls in place to identify and control risk and review Center effectiveness. The systems are designed to manage, rather than try to eliminate, the risk of failure in achieving Centers' strategic objectives, and thereby provide reasonable assurance against material misstatement or loss.

On matters of governance, the Alliance Board held the ninth Board Training Program following the Annual General Meeting 2006. Since 2004, the program has trained 145 board members and board secretaries in the roles and responsibilities of a trustee, in financial and risk management, and in human resources within the CGIAR System.

We feel confident that the Alliance, in the short time since it was so formulated, has acquired the momentum to achieve concrete results in the coming years for the benefit of many of the poorest communities in the world.

Jim Godfrey
Alliance Board Chair

Joachim Voss
Alliance Executive Chair

* DIVERSITAS, International Geosphere-Biosphere Programme, International Human Dimensions Programme on Global Environmental Change and World Climate Research Programme, which together comprise the Earth System Science Partnership.

Partnerships
IN SCIENCE FOR
Development

FAO-CGIAR: Ever-Expanding and Fruitful Collaboration

Cooperation between the Food and Agriculture Organization (FAO) of the United Nations and the CGIAR dates back to the 1960s, long before most of the international agricultural research centers were created. Indeed, it began some years before the earliest centers now supported by the CGIAR coalesced into the CGIAR System.

At first the focus was on genetic resources, but over time cooperation has expanded and diversified to cover governance, strategic planning, normative and technical cooperation, and information exchange. Cooperation is most extensive in crop production, addressing the development of improved crop varieties, the management of land and water resources, and other topics such as plant protection, seed systems, conservation agriculture and water management. Animal husbandry and health, forestry, fisheries, natural resource management and capacity building — with special attention to strengthening national agricultural research systems — are other important fields of collaboration.

Collaboration between FAO and several CGIAR Centers on the Comprehensive Assessment of Water Management in Agriculture is considered particularly successful. The objective of this initiative is to provide a comprehensive picture of the situation prevailing in water management in agriculture, and of its implications in terms of policy formation and investments for food production, environmental protection and rural livelihood. The results will enable better investment and management decisions on water and agriculture in the near future and over the next 50 years.

A survey on the CGIAR Centers' collaboration with other institutions — conducted in 2006 by the Science Council Secretariat — found that FAO was the only organization among the 3,000 identified that works with all of the Centers. Similarly, an evaluation of FAO partnerships and alliances identified the CGIAR and its 15 Centers as FAO's most frequent partners, and the relationship with them was described as especially intensive and positive.

FAO-CGIAR collaboration will enable better decisions on water and agriculture management over the next half century.

One of the oldest cooperative relationships in modern agricultural research is also among the strongest today and most essential for the future

The International Treaty on Plant Genetic Resources for Food and Agriculture, adopted by the FAO Conference in 2001 and entering into force in 2004, recognizes the importance of the CGIAR Centers and their *ex situ* collections of crop germplasm. Under Article 15, the treaty gives the Centers a legal framework and provides for contracting parties to give the Centers access to plant genetic resources for food and agriculture. On 16 October 2006, the director general of FAO, acting on behalf of the governing body of the treaty, signed agreements with the CGIAR Centers placing their *ex situ* collections under the treaty (see page 15).

Another example of fruitful CGIAR-FAO collaboration is the country-driven preparation of the *First Report on the State of the World's Animal Genetic Resources*. The report will be considered in September 2007 by the First International Technical Conference on Animal Genetic Resources, to be hosted by the government of Switzerland. Several CGIAR Centers and the CGIAR's Systemwide Genetic Resources Program have been associated with the report's development from its earliest stages.

Budget limitations and the need for greater efficiency and effectiveness in the drive to achieve the Millennium Development Goals (MDGs) point to a need for the periodic review and updating of joint activities between FAO and the CGIAR. The shared challenge of eradicating extreme poverty and hunger (MDG 1), while ensuring environmental sustainability (MDG 7), is a natural starting point for focusing cooperative work. An FAO-CGIAR joint program for the rehabilitation of agricultural and forestry research for food security in the Democratic Republic of Congo, initiated in 2006 and funded by the European Commission, is one good example (see page 13).

People's Republic of China: Long History of Partnership

China's history of cooperation in agricultural research and rural development with various international organizations and countries has been long and fruitful. Collaboration between China and the CGIAR dates back to the CGIAR's first years in the early 1970s. Initial collaboration covered only limited areas of research, but the collaboration deepened fundamentally after China became a Member of the CGIAR System in 1984. During the last 3 decades, the CGIAR's collaboration with China has been very successful.

Germplasm exchange. China has received nearly 50,000 accessions of crop genetic material from CGIAR Centers and developed 252 crop varieties using their genetic background. Among them, 160 are wheat, 25 rice, 18 potatoes, 16 sorghum, 15 peanuts and 12 maize. The combined planted area of these varieties has reached 5.6 million hectares. Meanwhile, China has provided more than 20,000 accessions of various crop germplasm to CGIAR Centers for evaluation and distribution.

Scientific collaboration. Over 50 Chinese institutions have collaborated closely with CGIAR Centers. More than 200 collaborative projects between China and CGIAR Centers have ranged widely over agricultural research, extension, education, production and processing. These projects include germplasm collection, storage, characterization, exchange and utilization; crop breeding and biotechnology; integrated pest and natural resource management; sustainable development; macro agricultural policy; postharvest processing; personnel training and capacity building; and international academic and information exchange. Nearly 40 collaborative projects have received national or provincial awards.

Capacity building. Since the 1980s, CGIAR Centers have trained over 4,000 Chinese scientists who have subsequently risen to senior positions in their own institutions, 150 of them becoming project coordinators and 40 of them director or deputy director. Ten have become presidents of provincial academies of agricultural science or government department heads. Ever more Chinese scientists work as internationally recruited staff in the CGIAR and its Centers or serve on the Executive Council or as board members.

Information exchange and conference organization. Over the past 30 years, China has received more than 110,000 copies of agricultural research publications from CGIAR Centers and individual scientists. These have helped Chinese researchers better understand their research areas in the light of broader prospectives. More than 40 international conferences and workshops with sponsorship by CGIAR Centers have taken place in China — and the CGIAR will hold its 2007 Annual General Meeting in Beijing. Meanwhile, China has sent more than 2,000 scientists to attend international conferences and scientific exchanges abroad as part of its collaboration with the CGIAR, thus enhancing international collaboration and heightening China's global impact.

Construction of a collaborative platform. The growing strength of the China-CGIAR partnership is reflected by the establishment in China of liaison offices by seven CGIAR Centers and joint laboratories by five of them. Particularly notable is the recent move to set up an International Potato Center-China center for Asia and the Pacific. These strengthened ties indicate a brilliant future for the China-CGIAR partnership in agricultural research and collaboration.

China has developed 252 crop varieties using CGIAR germplasm.

Active in international agriculture research since the first years of the Consultative Group, China will host the 2007 Annual General Meeting

Democratic Republic of Congo: Facing Up to Challenges

Agricultural research in the Democratic Republic of Congo (DRC) was until 1970 organized mainly through the INEAC, the national institute for agronomic studies that maintained its headquarters at Yangambi and more than 30 centers and stations in different agricultural environments. The diffusion of its high-quality research results to farmers large and small fueled exports of palm oil, coffee, cocoa, rubber and tea. Production of all these commodities has dramatically declined since 1987. One reason for this decline is disintegrating transport infrastructure that cripples the distribution of inputs and marketing of produce; another is limited capacity in agricultural training, research and extension following staff localization in 1973.

According to the World Bank, 92% of households in the DRC now experience food insecurity. Poverty and the resulting unsustainable exploitation of forest resources threaten future development.

Higher education in agriculture was until 1990 found mostly at the Yangambi Institute of Agronomy, but today the universities of Kisangani, Kinshasa and Lubumbashi also have agricultural programs. Agricultural research remains constrained by shortages of qualified scientific staff and teachers, scientific equipment, and Internet connections, as well as by the lack of coherent policies on education and research and development.

Throughout the DRC's difficulties, research Centers supported by the CGIAR have been present, providing training — notably resulting in the formation of the National Institute for Agronomic Study and Research (INERA by its French acronym) with staff trained by the International Livestock Research Institute and World Agroforestry Centre — and new crop cultivars to enhance food security.

An important contribution from the International Institute of Tropical Agriculture, though INERA, has been cassava resistant to the cassava mosaic virus. Resistant varieties are in the pipeline to nongovernmental organizations in collaboration with the Food and Agriculture Organization of the United Nations and the South-East Consortium for International Development of the United States.

Musa (banana and plantain) is the second most important staple food in the DRC after cassava and is particularly important to the poor. The major constraints to *Musa* productivity are low soil fertility, banana bunchy top virus, banana weevil and banana *Xanthomonas* bacterial wilt, which is spreading across eastern DRC at 30 kilometers per year. High-yielding and resistant *Musa* hybrids from the Honduran Foundation of Agricultural Research, introduced through Bioversity International, are being tested by INERA at the University of Kisangani. Meanwhile, Bioversity supports one study on banana and plantain diversity in the northeastern Congo Basin and another characterizing bananas in eastern Congo. Plantain varieties are being collected, established in field collections, duplicated *in vitro* and transferred from Kisangani to Bioversity's International Transit Center for exchange.

The recent emergence of political stability presents many opportunities for new partnerships to improve crops, forestry, aquaculture and fisheries. Efficient agricultural development demands a coherent education and research policy arising from a plan to be devised by INERA in partnership with universities and CGIAR Centers.

Dr. B. Dhed'a Djailo
Academic Secretary General
Yangambi Institute of Agronomy

The recent emergence of political stability presents many opportunities for new partnerships to improve crops, forestry, aquaculture and fisheries

Horn plantain is collected in the village of Yalokombe in eastern Democratic Republic of Congo for conservation and exchange.

Japan International Research Center for Agricultural Sciences: Aligning Cooperation With Overseas Development Assistance Goals

Japan refines its priorities to ensure the continued relevance of its long tradition of collaborative international agricultural research

The Japan International Research Center for Agricultural Sciences (JIRCAS) is the sole national institute in Japan that undertakes comprehensive research on agriculture, forestry and fisheries technology in developing areas of the tropics and subtropics through international collaboration and cooperation. As such, JIRCAS is a focal institution of the CGIAR and has developed strong partnerships in the CGIAR System. The successor organization of the Tropical Agricultural Research Center following its reorganization in 1993, JIRCAS has enjoyed a long history of collaborative research programs with, since its establishment, almost all of the CGIAR Centers. In 2006, JIRCAS sent nine researchers to engage in collaborative research in six CGIAR Centers.

The Second Medium-Term Plan (2006-2011) of JIRCAS sets out two major programs in line with Japan's policy on overseas development assistance. The first is research and development of agricultural, forestry and fisheries technologies that aim to solve global food and environmental problems. Second is the collection, analysis and publication of information revealing trends in international food, agriculture, forestry, fisheries and farming systems. JIRCAS will continue to strive to achieve the goal of accurately determining and satisfying the demands of the international community. To achieve this goal, the new Medium-Term Plan calls for JIRCAS to conduct effective strategic collaboration with CGIAR Centers, thereby continuing to achieve greater scientific contributions to improved agriculture in developing countries.

JIRCAS's past contributions are legion. For example, it introduced to the world the dehydration responsive element binding (DREB) genes in the model plant *Arabidopsis thaliana*. DREB genes control the expression of more than 40 *Arabidopsis* genes responsible for tolerance to such environmental stresses as drought, salinity and low temperature. Using these genes, JIRCAS has started collaborative projects with several CGIAR Centers to develop novel varieties of resilient crops.

Japan collaborates in applying DREB genes to develop novel crop varieties that tolerate drought, salinity and low temperature.

Aside from research programs, JIRCAS has organized international symposia cosponsored by the CGIAR. In 2005, the international symposium Perspectives of R&D for Improving Agricultural Productivity in Africa took place in Tokyo. In 2006, marking the International Year of Deserts and Desertification, the symposium Living with Deserts was held in Tokyo.

Another successful innovative partnership is the Japan-CGIAR Fellowship Program. The Japanese Ministry of Agriculture, Forestry and Fisheries launched the program in 2004, and JIRCAS administers it. The fellowship was designed to help young Japanese scientists expand their expertise in international agricultural research for development. In 2006, during the fellowship's third phase, 10 fellows worked at CGIAR Centers for about 2 months each, bringing to 32 the number of fellows who have successfully completed the program. Many have spoken very positively of their experience.

"The program allowed me to become acquainted with many researchers from various countries and to learn advanced research techniques," reports Yuhei Hirono, who completed his research fellowship at the International Rice Research Institute. "This experience was precious for me. The fellowship program is a valuable opportunity for young researchers to broaden their horizons."

Systemwide Genetic Resources Program: Where It All Comes Together

The long process of building a coherent global system to govern the conservation and exchange of crop genetic resources is finally coming to fruition — and celebrated by an award for the genebanks at the heart of the matter

CGIAR genebanks hold the world's largest collections of plant diversity for food and agriculture.

Several developments in 2006 made it a banner year for ensuring durable world food security. Genebanks were upgraded, new agreements on access to accessions and information were signed, and the Global Crop Diversity Trust made its first grant of support — to a genebank of the CGIAR. These efforts were recognized with the presentation of the CGIAR Partnership Award to the System-wide Genetic Resources Program.

Eleven of the Centers supported by the CGIAR manage genebanks, which together contain over 600,000 accessions of about 3,000 staple crop, forage and agroforestry species essential to human food security and nutrition. These genebanks, which are fundamental to the CGIAR's work on plant improvement, hold the world's largest collections of plant diversity for food and agriculture, repositories not only of plant diversity but also of information and expertise unique in the scientific and agricultural spheres. The information, and the accessions it describes, are freely available to all.

In 1994, the CGIAR Centers, recognizing the status of their collections as global public goods and their importance to human development, placed the collections under the aegis of the Food and Agriculture Organization (FAO) of the United Nations, held in trust for the world community.

The agreements that conferred this in-trust status were interim, pending renegotiation of the International Undertaking on Plant Genetic Resources to harmonize it with the Convention on Biological Diversity. That long process resulted in the legally binding International Treaty on Plant Genetic Resources for Food and Agriculture, which came into force in 2004 and paved the way for the Centers to sign new and definitive in-trust agreements with the governing body of the treaty in October 2006.

The signings give legal weight to the central role that the in-trust collections will play in the multilateral exchange system established by the treaty. This system will guarantee free, long-term access to some of the world's most important collections of agricultural biodiversity, while requiring commercial users to share benefits with the global community. At its first meeting in June 2006, the governing body of the treaty adopted a standard material transfer agreement that sets out terms governing access and benefit sharing for the multilateral system and will accompany all transfers of plant material by the CGIAR Centers and all parties to the treaty, which number more than 110.

The in-trust crop genetic resources are vital to the CGIAR's achieving its objectives, particularly the

System research priority to promote the conservation and characterization of staple crops. An investment in securing the collections is thus an investment in the CGIAR's chief goals. Over the past decade, the CGIAR Centers carefully reviewed their genebank operations and calculated the costs of effectively and efficiently conserving the collections under their care. This allowed them to identify practical and strategic actions to ensure that they can meet their obligations as trustees.

The costing studies provided a sound basis for securing World Bank support to upgrade the collections. Phase 1 of the upgrading, budgeted at US$13.6 million, ended in 2006. Its achievements are impressive, reflecting the twin targets of the project: to upgrade the facilities at the 11 Centers with genebanks and to put those facilities to work. Following the recommendations of an external review of the project, a second phase got underway in January 2007. Phase 2 will complete the upgrading of the in-trust collections and support the CGIAR's intention to play a central role in the development and implementation of a global system for the conservation and use of crop diversity in support of the International Treaty on Plant Genetic Resources for Food and Agriculture.

The costing studies were also an important contribution to the Global Crop Diversity Trust's campaign for an endowment fund to support in perpetuity the world's most important crop genetic resources collections, including those held by the CGIAR Centers. The trust, established by the CGIAR Centers and FAO in 2004, announced its first long-term conservation grant to a Center collection — the International Rice Genebank at the International Rice Research Institute — at the CGIAR Annual General Meeting in 2006.

The capacity of the CGIAR Centers to meet the policy and technical expectations that their in-trust role has created is greatly enhanced by their participation in the Systemwide Genetic Resources Program (SGRP). Established in 1994, the SGRP has brought coherence, effectiveness and efficiency to the genetic resources activities of the CGIAR System. In 2006, the CGIAR honored the SGRP and its participants — the 11 CGIAR genebanks, International Food Policy Research Institute, FAO and SGRP Secretariat — with its prestigious partnership award, accepted on their behalf by Jane Toll, the SGRP coordinator. The award recognized the effectiveness of the team's efforts to protect the in-trust collections under their care as well as the leadership of the Centers in the global plant genetic resources community.

The CGIAR Centers have made valuable strides — many of them over the past year — toward a shared vision of a global system for the conservation and use of vital crop diversity. Their efforts have positioned the CGIAR to give coherence and leadership to the global system, placing the in-trust collections at the heart of the matter, where they will underpin food security for humanity's future.

Members' Perspective: Engage Civil Society and Embrace Diversity

The CGIAR and its critics must seek opportunities to learn from each other with mutual respect for their differing roles, views and approaches

Many Members of the CGIAR joined the chorus of support for new efforts to enhance partnerships with civil society organizations (CSOs), when it came time to discuss this key agenda item during the Annual General Meeting 2006 (AGM06) Business Meeting. Three Members — Norway, United Kingdom and United States — were especially supportive, not just then but earlier, in the months leading up to the Civil Society-CGIAR Forum held at AGM06.

Attracting 400 participants, among them about 100 CSO representatives, the forum reaffirmed the CGIAR's commitment to working with this numerous, diverse and vital group of stakeholders. Its overarching goal was to highlight innovative ways of making research and development more relevant and effective in improving rural livelihoods. To this end, the event fostered the sharing of information about current and past partnerships with community-based organizations, universities and nongovernmental organizations, and it gathered a bountiful harvest of ideas for improving and expanding the CGIAR's engagement with them.

The idea of the forum having captured the imagination of representatives from Norway, United Kingdom and United States in particular, as mentioned above, they committed funds to cover the costs of the event and of the Pilot Competitive Grant Program announced at its conclusion. To find out more about the views that led these three Members to pledge this support, the CGIAR Secretariat consulted recently with

- Ruth Haug, professor and head of the Department of International Environmental and Development Studies at the Norwegian University of Life Sciences;
- David Howlett, team leader for growth and livelihoods in the Central Research Department of the UK's Department for International Development; and
- Franklin Moore, director for environment and science policy at the US Agency for International Development.

The responses given below to seven forward-looking questions about the CGIAR's collaboration with CSOs are a synthesis of their replies, which proved remarkably congruent.

In partnerships with CSOs, how can the CGIAR Centers reconcile their desire to enhance development impact with their need to remain focused on strategic research leading to the generation of international public goods?

We need to challenge the view that, when CGIAR Centers engage with CSOs, they are necessarily doing development rather than the research they see as their mandate. On the contrary, the purpose of this engagement is to help ensure that research is sharply focused on the needs of the poor, as illustrated by the dozens of partnerships featured in the Innovation Marketplace at AGM06. There need not be a dichotomy between research and development in these partnerships but rather the kind of careful integration that generates relevant solutions that work in the field.

What are some ways in which the CGIAR can foster collaboration with CSOs?

The CGIAR and the CSO community must seek opportunities to learn from and listen to each other with mutual respect for their differing roles, views and approaches. To this end, the CGIAR needs to meet CSOs in their own arenas, in addition to inviting CSOs to attend CGIAR events. In these encounters, the CGIAR needs to show that CSO

perspectives, even those that meet opposition, can still influence CGIAR decisions and actions.

Given the great number and diversity of CSOs involved in agricultural research and development, how can the CGIAR work most effectively with them?

The CGIAR should have a blueprint for developing genuine partnerships with diverse actors at different levels in pursuit of clear purposes. National and local CSO partners are critically needed for identifying problems, facilitating dialogue with technology users and fostering rural innovation through shared projects. But projects should not be the exclusive focus. The CGIAR also needs CSO allies at the global level to make the case for agricultural research as a key contributor to economic growth and social development. In addition, individual Centers and the CGIAR as a whole need to form alliances with CSOs through which they can exchange constructive criticism and, when necessary, challenge cherished assumptions.

What can we expect to gain from projects to be developed through the recently created Pilot Competitive Grant Program?

It is important for CSOs to have ownership of the program, so it is not viewed as just a way for the CGIAR to provide CSO "clients" with financial assistance. The purpose should rather be to learn how the CGIAR can best work with diverse stakeholders. This, in turn, requires a conscientiously facilitated learning process across projects grounded on shared monitoring and evaluation. The projects also need ways to communicate with one another and to share lessons learned. If successful, the projects can form the beginnings of a CSO-CGIAR network that has the potential to change the way we work.

What opportunities might new Challenge Programs present for enhancing CSO-CGIAR collaboration, and how can the programs take advantage of these opportunities?

It is important that CSOs be involved early on in these programs, not as an afterthought. Moreover, they should be present, not only to help secure funds, but to ask hard questions about the challenges as defined by the CGIAR and to make contributions that are essential for meeting these challenges.

In what ways have CSOs influenced Members' views about agricultural research and development?

CSOs in the North are well organized, and the quality of their work is steadily improving. As a consequence, they exert growing influence on research — both in the CGIAR and more generally — with respect to its environmental impacts, relevance for the poor and benefits for particular groups such as women, indigenous peoples and others who are often marginalized. Another of these CSOs' concerns centers on genetically modified organisms. The question is this: How well do they represent voices from the South? Perhaps, only somewhat. So, how can we do a better job of listening to Southern voices, of providing resources for this purpose, so that Southern partners also have the chance to challenge our assumptions?

How should the CGIAR handle its relationships with CSOs that are highly critical of its actions and positions on certain issues?

The CGIAR should not shun criticism from CSOs but rather remain open to their feedback and to new options for improving performance.

Innovation Marketplace: Honoring the Best of the Best

Progress in the fight against poverty, hunger and environmental degradation can appear elusive. Global climate change alone is a monumental problem whose solution seems veiled in clouds of complexity. But, like satellite imagery zooming in on cities, villages and individual dwellings, a closer look at local and regional efforts to address global challenges offers a refreshing perspective.

In many developing countries, civil society organizations (CSOs) are pairing with such international scientific networks as the CGIAR to tackle everything from malnutrition to women's empowerment, crop improvement and rainforest protection. The results are real and gratifying, especially so regarding the CSO-CGIAR partnerships highlighted at the third and largest Innovation Marketplace, a centerpiece of the CGIAR's 2006 Annual General Meeting.

The CGIAR selected more than 50 CSO partnerships — the best of the best — to compete for the 2006 Innovation Marketplace Award. The eye-catching exhibits offered an unforgettable tribute to the solid accomplishments of CSO-CGIAR partnerships and a rich legacy of best practices.

Five of the partnerships received the Innovation Marketplace Awards, including the prestigious People's Choice Award. The five awards combined included $30,000 in prize money to be used for strengthening collaborative capacity.

Eat Orange! combats malnutrition in sub-Saharan Africa, where more than 40% of children under age 5 are vitamin A deficient, significantly worsening their risk of blindness and death. A partnership of Helen Keller International (HKI), HarvestPlus Challenge Program and International Potato Center, Eat Orange! launched an aggressive educational and marketing campaign to promote vitamin A-rich orange-fleshed sweetpotatoes, prompting more than 115,000 families in Burkina Faso, Mozambique and Niger to incorporate the healthful tubers into their diets.

Winners of 2006 Innovation Marketplace with judges and the CGIAR chair.

Fifty of the most effective partnerships submitted were selected to complete for five Innovation Marketplace Awards

"We're using the award money to expand our work," explained Shawn Baker, HKI's vice president and regional director for Africa. "Our vision is to have a presence in at least five more countries over the next 5 years."

Water for Life, a creative partnership between Fundacion Natura Bolivia and the Center for International Forestry Research, pioneered payments for environmental services to conserve threatened cloud rainforests and protect watersheds in the Santa Cruz area of Bolivia. Upstream landowners receive training in honey production and one artificial beehive for every 10 hectares of threatened rainforest they have conserved for a year. Downstream users, who suffer severe economic losses when water flows are restricted, contribute to the payment scheme.

"Since December 2006, we've added hundreds of hectares of cloud rainforest to the project," said Nigel Asquith, director of science for Natura Bolivia. "Local governments, which represent downstream interests, have committed $3,000 to a new water fund. We're trying to develop neighboring watersheds in Latin America and link with similar efforts in South Africa and India."

The New Public-Private Partnership to Develop Irrigated Rice is the outgrowth of an innovative alliance between the Latin American Fund for Irrigated Rice (FLAR by its Spanish acronym) and the International Center for Tropical Agriculture. The partnership, which teams the Center with 14 Latin American countries, was created to meet the needs of farmers and industry for innovations to make irrigated rice production sustainably efficient, competitive and profitable. The award money will be used to build FLAR's institutional strength, the key to its success in helping poor farmers. Gonzalo Zorrilla, FLAR's executive director, is enthusiastic about the possibilities.

"We're improving the FLAR network and supporting technical activities at the country level," Zorrilla said. "For example, annual meetings on tropical and temperate environments will enable us to maximize interactions with scientists and researchers."

Nine varieties of irrigated rice were released in 2006 and an additional three varieties in the first quarter of 2007.

"FLAR's regional approach is critical," Zorrilla added. "And the private sector's strong representation helps ensure that technical solutions match the needs and demands of our farmers."

Sunn Pest Management, a 10-year collaboration between the University of Vermont and the International Center for Research in the Dry Areas aims to improve crop production in impoverished regions of the Middle East. The sunn pest is a group of insects that inject saliva into wheat, breaking down its gluten and harming the baking quality of flour made from it. It is prevalent throughout West Asia and in parts of Central Asia and North Africa.

The partnership has brought policy change, as Turkey, Syria and Iran have stopped aerial applications of pesticides to combat the sunn pest, applying instead insect-killing fungi as biological control and using novel screening methods to identify resistance in wheat.

"This award shows donors the importance of our work," said Margaret Parker, a university entomologist who worked with colleague Bruce Parker to establish the partnership. "The award money is helping to keep up the momentum so that we're ready when larger resources arrive."

Better Policy and Management Options for Pastoral Lands is a result of collaboration by the Kitengala Ilparakuo Landowners Association and the International Livestock Research Institute (ILRI). Under this partnership, wildlife conservation organizations lease land from Kenyan pastoralists to conserve for seasonal wildlife migrations. Participating families continue to graze their livestock on the land but agree not to fence, develop or sell it. Significantly, women who manage households receive most of the lease income.

"This award has shown us that progress can be achieved through partnership," said Ogeli Makui, program coordinator. "A number of worthwhile projects have been identified by the community — for example, expanding herds of dairy goats in partnership with Heifer International, Kenya Wildlife Service, ILRI and the local community."

What about the future? "The Kenya Wildlife Service has started contributing to the lease program, and about 3,000 acres [1,200 hectares] have been added," Makui said. "The service is committed to funding the same acreage for the next 4 years. We're hopeful that we'll realize our goal of leasing and conserving 60,000 acres in perpetuity."

These award-winning collaborations show that combining innovative partnerships with science-based solutions can bring measurable progress against pressing poverty, food security and environmental problems. CGIAR Centers and Challenge Programs have active partnerships with nearly 1,000 CSOs, whose unique perspectives and creative approaches are invaluable for promoting agricultural growth, protecting the environment, and fostering human health and well-being.

Centers
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CGIAR

Africa Rice: Video Kills the Pests in the Jar

A video program that allows women to share postharvest technologies across Bangladesh expands its reach to Africa

Mamadama and Parul have never met, as Mamadama is from the West African country of Guinea and Parul from Bangladesh in South Asia. Yet Mamadama is learning from Parul simple innovations that are quietly transforming daily life in her village, providing an example of how local knowledge and innovations are spreading from one community to another, and from one region to another, through media and partnership with nongovernmental organizations (NGOs).

"Most of us assume that scientists are the sole source of innovation in agriculture," says Dr. Paul Van Mele, technology transfer specialist at the Africa Rice Center (WARDA). "We forget that farmers innovate to capitalize on their day-to-day experience."

Unfortunately, farmers' knowledge often remains locked in individual families or communities, if not completely lost, for lack of suitable mechanisms of dissemination. Video is proving to be a powerful tool for documenting and strengthening local innovations and expanding their impact by facilitating their exchange. With the help of partners from national programs and NGOs in Africa, Van Mele has begun introducing to African farmers videos on rice seed health produced in 2003 as part of a women-to-women agricultural extension project in Bangladesh.

"Although these videos were produced for Bangladesh, we're testing their usefulness in Africa, because rice farmers in many developing countries face similar challenges, such as access to high-quality seed," Van Mele comments. "Through video, we can better explain innovations' underlying scientific principles."

WARDA's partners have translated the Bangladeshi videos into several African languages. In 2006, they showed the videos to over 6,300 farmers in Gambia, Mali and Guinea. APEK Agriculture, a Guinean NGO, uses the videos in French, followed by discussions on community-based seed systems, to train farmers and technical staff of grassroots organizations. That is how Mamadama, in her Guinean village of Touguikhoure, was able to see with her own eyes how Parul and her neighbors in Maria village in Bangladesh store rice seed and protect it from insects.

Seeing is believing as Mamadama Camara (center) from Touguikhoure village in Guinea reports what she learned from Asian farmers through the videos on rice seed health.

"From the video, I learned to use *neem* leaves to control insects," Mamadama reports, adding that the Maria village practice of storing seeds in airtight containers echoes her grandparents' advice. "I will now store my maize and rice seed like them and pass this knowledge on to my children."

A radio interview of Mamadama and her friends on the videos aired on a local station twice weekly for 3 months, potentially reaching over 800,000 people.

WARDA, in partnership with the national program in Benin and the international NGOs Sasakawa-Global 2000 and Centre Songhai, has recently produced videos of women processing rice to enhance knowledge of improved postharvest technologies.

Participatory learning and action research has found success in improving farmers' management skills despite its challenges. "Initial investment costs are high," Van Mele concedes, "because participatory processes involve intensive interactions, interpersonal communication and negotiations. Modern media can re-enforce innovations by strengthening institutional capacities while scaling-up participatory approaches alongside scientific and local innovations."

Africa Rice Center (WARDA)
Headquarters: Cotonou, Benin
www.warda.org

Bioversity: Cultivating Local Understanding

Farmers in Nepal's Pokhara Valley had reason to celebrate in 2006. The National Variety Approval, Release and Registration Committee of the National Seed Board of Nepal approved a new version of Jethodbudho, a local traditional rice variety, that had been improved through participatory plant breeding. Millers and merchants pay a premium of 25% for the new variety.

A boy and his father present a sheaf of rice at a community seed-production site near Pame, a village in the Pokhara Valley of Nepal.

"The release of Pokhareli Jethobudho is the result of a great collaboration involving farmers, NGOs, NARS, extension workers and the private sector," says Dr. Bhuwon Sthapit, one of the coordinators of the project, using the acronyms for nongovernmental organizations and national agricultural research systems. "The new variety holds a lot of promise for improving the livelihoods of local farmers."

As the approval and release of a variety developed through participatory plant breeding raises the issue of farmers' rights, the project is developing an appropriate legal framework that protects it and the rights of farmers as its custodians. The Genetic Resources Policy Initiative of Bioversity International[1] has been working closely with Nepali partners since 2002, raising the capacity of initiative partners to weigh diverse perspectives on genetic resource policy issues and needs. As a result, they became powerful local advocates for the legal change that permitted the registration of the improved Jethobudho landrace.

"The release of Pokhareli Jethobudho has paved the way for establishing intellectual property rights for Nepal's farming communities," observes Pratap Shrestha, executive director of Local Initiatives for Biodiversity, Research and Development (LI-BIRD), a local NGO.

Deep in the Pokhara Valley, farmers from Begnas, Pame and surrounding villages in Kaski District have been growing Jethobudho for generations. "Jethobudho rice is one of the varieties favored by consumers because of its soft texture and its unique aroma and flavor," explains Sthapit, adding that these qualities made it an ideal candidate for participatory landrace enhancement.

With the support of Canada's International Development Research Centre, the farmers worked with researchers from Bioversity, LI-BIRD and the Nepal Agricultural Research Council to improve the Jethobudho landrace. Farmers supplied 338 samples of locally grown Jethobudho, which underwent 3 years of trials and selection for desirable traits. Six top-performing lines were handed over to farmers for participatory varietal selection. Close to 300 farmers from the Pokhara Valley compared the improved selections with their own Jethobudho varieties. They greatly preferred the best of the improved selections, which offered 40% higher yields.

Stakeholder awareness and advocacy of a balanced genetic resource policy prepares the ground for an improved traditional rice variety

To benefit as many farmers as possible, the project and the government agricultural extension office of Kaski District set up a seed-production system in the community to ensure adequate seed supplies. The project also works to link community seed producers to markets.

Pokhareli Jethobudho could even interest export markets in the Middle East. "Jethobudho's small grain, soft texture, and excellent qualities of volume expansion and aroma during cooking make it well suited to a number of dishes popularly consumed in the region," explains Sanjay Gyawali, a plant breeder with LI-BIRD.

1 The International Plant Genetic Resources Institute and the International Network for the Improvement of Banana and Plantain now operate under the name Bioversity International. The name echoes a new strategy that focuses on improving people's lives through biodiversity research.

Bioversity International

Bioversity International
Headquarters: Rome, Italy
www.ipgri.org

CIAT: Cloning Clean Seed and Creating 'Scientists'

Researchers and cassava farmers collaborate in applying low-cost laboratory techniques in the field to produce seed free of frogskin

Small-scale farmers in Colombia are using low-cost *in vitro* propagation to multiply clean cassava seed and so control a disease that has devastated this staple crop and threatened their food security. Integrating into routine farm practice the use of fine tissue culture in glass containers further promises to spread the benefits of clean seed production to other cassava-growing areas and other clonally seeded crops.

Frogskin is one of the most damaging cassava diseases, affecting root growth and causing yield losses of over 90%. Present in most cassava-growing areas of Colombia since the 1980s, the disease has gradually spread through much of Latin America and is now reported in Brazil, Costa Rica, Ecuador, Panama, Peru and Venezuela.

In 2002 and 2003, an interdisciplinary group of researchers and technical staff led by the International Center for Tropical Agriculture (CIAT by its Spanish acronym) set out to train small producers in Santa Ana, a rural community in Colombia's Cauca Department, in laboratory practices using low-cost tools. The group — which teams CIAT and the CIAT-led Cassava Biotechnology Network (CBN) with Colombia's Foundation for the Participatory and Sustainable Development of Small Farmers, Colombian Corporation for Agricultural Research, and Foundation for Agricultural Research and Development — subsequently oriented participating farmers in the application of *in vitro* methodology to produce cassava plants free of this dread disease.

The methodology was tested with six clones, producing 6,000 plants that were later certified free of frogskin by the Colombian Agriculture and Livestock Institute. Under the guidance of experts, the producer group further developed a rapid propagation system to increase the number of plants available for subsequent distribution to cassava producers.

"We believe that the system can be replicated in other regions of Colombia and in other areas where there is a need to renew cassava planting materials," says Dr. Roosevelt Escobar, CIAT principle researcher for the project.

Biotechnology techniques are no longer confined to laboratories.

The plan is to incorporate other crops into this research scheme, taking advantage of existing facilities and requiring only minimal investment. CBN has established experimental sites in Ecuador and Brazil, where similar practices are now being used to propagate disease-free cassava.

"As a farmer, I had never done laboratory work," says Doris Castillo Campo, one of the farmers participating in the project. "I always thought that this type of work was just for holders of doctorate degrees. Now I feel like a scientist, too. This experience has given me self-confidence and made me feel that I'm doing important work to help improve the living conditions of my neighbors. That's a really nice feeling."

"The project now aims to develop an *in situ* system for protecting native cassava varieties that will prevent the loss of agrobiodiversity while enhancing food security," reports Escobar. "It will also allow a more objective comparison between local and improved varieties."

CIAT
Centro Internacional de Agricultura Tropical
International Center for Tropical Agriculture

International Center for Tropical Agriculture (CIAT)
Headquarters: Cali, Colombia
www.ciat.cgiar.org

CIFOR: Advocating Sound Forest Policy

A market graphically illustrates the complexity of regulating trade in non-timber forest products.

One aim of the Center for International Forestry Research (CIFOR) is to help inform and shape policymaking to benefit forests and those who depend on them for their livelihood. To this end, research findings must be made accessible to policymakers, development agencies and national agricultural research centers. In 2006, CIFOR scientists and their partners thereby helped convince the Brazilian government to rescind regulations that hampered the sustainable trade in non-timber forest products (NTFPs).

In recent years, CIFOR has produced a large body of work on NTFPs. The Non-timber Forest Product Case Comparison Project, which involved over 60 researchers from 27 countries, provided detailed analyses of the use, management and marketing of some 61 NTFPs around the world. The book *Fruit Trees and Useful Plants in the Lives of Amazonians*, in which CIFOR scientists Dr. Patricia Shanley and Dr. Gabriel Medina describe 30 Brazilian trees and palms whose fruits, nuts and fibers are used by local people, has been widely used and praised by educators, policymakers and politicians. Shanley is also a coauthor of *Beyond Timber: Certification of Non-timber Forest Products*, which synthesizes the findings of nine case studies from Latin America, Africa and Asia.

A common theme emerging from these studies is that overregulation and red tape seriously impede the trade in NTFPs. With this in mind, Dr. Antonio Carlos Hummel, director of national forests for IBAMA, Brazil's environmental protection agency, invited CIFOR scientists to a July 2006 meeting of senior policymakers in Brasilia. Shanley and her colleagues highlighted the important role NTFPs play in the livelihoods of poor forest dwellers and how government regulations governing the transport of NTFPs in Brazil and many other countries hamper the trade.

Hummel agreed, telling participants how Ver-o-Peso — the open-air market on the banks of the Amazon in Belém with an array of fruits, fiber, nuts, roots and gums — graphically illustrates the complexity of the NTFP trade and the impracticability of applying standardized regulations to control it. To support his argument in favor of liberalization, Hummel cited *Beyond Timber: Certification of Non-timber Forest Products.*

One month after the Brazilian meeting, IBAMA announced that transport documents would no longer be needed for ornamental, medicinal and aromatic bulbs, fibers or leaves of native or planted species. Confirmation of CIFOR's influence came in a message from IBAMA's general coordinator of forestry resource management, Dr. José Humberto Chaves. "Clearly, the experience of CIFOR contributed significantly to the consensus of ideas surrounding this decision," he wrote.

Convincing policymakers to liberalize trade in non-timber forest products protects forests by enhancing the livelihood of their inhabitants

Lifting transport regulations will make a difference to many in the NTFP trade, be they collectors, growers or buyers.

"I'm very gratified that we've been able to influence policies on the transport of NTFPs," says Shanley. "But even more rewarding is the knowledge that decision-makers now realize that reliable information, based on sound science, is crucial to good policymaking."

CIFOR
CENTER FOR INTERNATIONAL FORESTRY RESEARCH

Center for International Forestry Research (CIFOR)
Headquarters: Bogor, Indonesia
www.cifor.cgiar.org

CIMMYT: First Step of a Long Journey

Barley yields in the Saraguro are now the second highest in South America.

Improved barley cultivars started farmers in the high Saraguro of Ecuador up the road from persistent food deficits to profitable surpluses

The people of the Saraguro have farmed these high, steep slopes of the Andes of southeast Ecuador for more than 500 years, isolated from the more prosperous parts of the country by high altitude and poor infrastructure. Difficult conditions have conspired to make a hard life, with food often running out before the next harvest.

In 1995, improved agricultural technology started trickling into the Saraguro through a modest project that offered farmers new varieties of barley, one of their main food crops. The two new varieties, Shyri and Atahualpa, were developed by Ecuador's National Institute of Agricultural and Livestock Research (INIAP by its Spanish acronym) using materials from the Barley Breeding Program for Latin America jointly led by the International Center for Agricultural Research in the Dry Areas and the International Maize and Wheat Improvement Center (CIMMYT by its Spanish acronym). The new varieties resisted diseases and had a potential yield much higher than what the farmers had been experiencing.

In the first season, only one farmer volunteered to try the new seeds. Jorge Coronel, an INIAP agronomist, worked with him. Coronel had taken an intensive breeding course at CIMMYT and brought his knowledge to bear on the problem of breeding varieties of barley suitable for the conditions of the Saraguro.

The farmer's bumper harvest was enough to convince 13 others to try the new seed, which Coronel offered, along with fertilizer, on credit. All repaid the loan in kind at harvest time.

The project, a partnership of CIMMYT, INIAP and the farmers themselves, with financial support from Spain and Canada, has grown over the years. In each of its 17 villages, one lead farmer distributes seed and encourages others to try new crops and practices. The results have been spectacular. Barley yields in the Saraguro are now the second highest in South America. The farmers, no longer facing a hungry time, now produce surpluses to sell. With intensification, some grow two crops per year instead of one.

Using participatory varietal selection, the farmers have diversified into improved wheat and quality protein maize, which has higher levels of two essential amino acids than regular maize. The yields of potatoes and other crops have quadrupled. With increased productivity, farmers have shifted their cereals to rainfed land, reserving irrigated land for more valuable crops. Some have built greenhouses to grow tomatoes.

Farmers are now improving soil conservation on the steep slopes by planting contour strips of perennial grass. They have dug 74 small reservoirs and want to start producing their own seed.

The 5,000-plus farmers of the Saraguro who have participated in the program since 1995 have experienced a remarkable improvement in their lives and livelihoods. The role played by CIMMYT has been small. But, without the initial breeding, there would have been no seed to improve farm productivity. Without the training, national program scientists in Ecuador might not have been so innovative. And without the partnership, nothing would have come together.

CIMMYT

International Maize and Wheat Improvement Center (CIMMYT)
Headquarters: Mexico City, Mexico
www.cimmyt.org

CIP: Sweet Feeding Study Results

A collaborative research project in rural Mozambique using orange-fleshed sweetpotato developed by the International Potato Center (CIP by its Spanish acronym) has shown conclusively that feeding young children sweetpotato rich in beta-carotene improved their intake of vitamin A and reduced the prevalence of low retinol in the blood, an indicator of vitamin A deficiency.

The work was the first community feeding study in Africa to follow intervention and control households and children throughout the initial adoption period. Such studies are rare because they are expensive and complex to design.

"Building on pilot experience in western Kenya, this project aimed to improve child-feeding practices and introduced a market-development component to assure sustained adoption," reports Dr. Jan Low, a CIP researcher who worked closely with the project, Towards Sustainable Nutrition Improvement.

Farmwomen learn how to prepare orange-fleshed sweetpotato juice, thereby adding value to their nutritious crop.

household members ate them and other locally available foods rich in vitamin A, as well as sources of protein and fat. And it worked to develop sustained markets for the new cultivars.

"These three pathways interacted and reinforced one another," explains Low.

A study finds that orange-fleshed sweetpotato raises vitamin A intake and improves the health status of children in Mozambique

The study was led by Michigan State University and enjoyed the collaboration of CIP, Mozambique Ministry of Health Nutrition Division, World Vision Mozambique, Helen Keller International, National Institute for Agronomic Research (INIA by its Portuguese acronym), and Southern African Root Crops Research Network (which is backstopped by CIP and the International Institute of Tropical Agriculture). Providing financial support were the Micronutrient Initiative of Canada, Rockefeller Foundation, United States Agency for International Development, and HarvestPlus Challenge Program (see page 41). The Southern Africa Root Crops Research Network (SARRNET)-INIA had released eight orange-fleshed sweetpotato varieties nationwide in 2000, of which five proved well adapted to conditions in central Mozambique.

Vitamin A deficiency is a primary cause of blindness in young children in Africa. A key project objective was to improve and maintain the intake of vitamin A and energy in children under 5. The project team adopted three approaches: It ensured the supply of orange-fleshed sweetpotato planting materials so that households could produce more energy and beta-carotene per hectare. It created demand for vitamin A-rich foods by persuading people to plant them and ensured that the most vulnerable

After 2 years, children in intervention households were consuming 8 times more vitamin A than those in control households. Orange-fleshed sweetpotato (OFSP) was the main source of that vitamin A. In an environment with extremely poor health services and little formal education for mothers, the study attributed to the intervention a 15% decline in the prevalence of low serum retinol in young children averaging 13 months old. The challenge remains to sustain wide adoption and impact.

"If we can get OFSP into the young child's diet, it has an impact," observes Low. "We found that, once a child reaches 1 year of age, the mother no longer prepares special porridges. So, in our current scaling-out efforts with HarvestPlus support, our focus is to increase the diversified use of OFSP in the general household diet so that children over 1 year of age eat OFSP when their parents do."

• CENTRO INTERNACIONAL DE LA PAPA • CIP

International Potato Center (CIP)
Headquarters: Lima, Peru
www.cipotato.org

ICARDA: A Better Handle on Water

A new approach to measuring water-use efficiency suits real conditions on the farm and is applicable across cropping systems

Many of the world's dry areas suffer acute and tightening water scarcity, limiting food production and worsening poverty and environmental degradation. Low-income agricultural countries are particularly at risk. Agriculture accounts for over 75% of total water use, but this share will fall as demand from industry and other sectors rises. Meanwhile, food production must increase to keep pace with population growth. The only solution is to use water more efficiently.

The first step is to measure current water-use efficiency (WUE) in agriculture, which is difficult, particularly where water is scarce. As most WUE studies in West Asia have considered only single crops, they have not reflected the complex decisions farmers make. Research by the International Center for Agricultural Research in the Dry Areas (ICARDA) and its partners, in collaboration with the United Nations' Economic and Social Commission for Western Asia, provides a new approach that better reflects actual conditions on farms in dry areas.

Traditionally, scientists have measured the quantity of a particular crop produced per unit of water, which is not useful for assessing multi-crop systems. Nor does it consider crop prices or water costs, or allow data from different farming systems to be easily compared. The new approach measures on-farm WUE as the ratio of water volume required to reach a production target to water volume actually used. This index allows comparisons across cropping systems and can be used both to identify low-WUE areas, or factors contributing to low WUE in an area, and to assess potential water savings from improved WUE in a given system.

In partnership with national agricultural research systems (NARS), the methodology was tested in six studies in Egypt, Iraq, Jordan and Syria. It proved to be a robust tool for evaluating WUE in different crops or areas.

Ongoing studies in Sudan, Iran and Syria are assessing on-farm WUE and looking at what factors determine it. Cropping systems are more or less water efficient for complex reasons: the availability of appropriate cultivars, knowledge of improved irrigation methods, agricultural pricing policies, water charges, and social and cultural factors. The new approach helps present the whole picture, integrating the various factors into a clear, objective index.

Give plants the water they need, but no more.

At a UN-sponsored workshop on WUE in November 2005, ten West Asian NARS noted the urgent need to improve WUE in agriculture. The new methodology has become an important component of regional efforts to assess water use, highlighting the role of science in catalyzing change. The work assists the targeting of research by providing a clearer understanding of the factors involved so that funding can be committed to areas where water savings will be greatest. At the same time, the knowledge gained can help policymakers design better incentive packages to encourage farmers to adopt more efficient water-management methods, especially regarding irrigation. This promises to improve productivity, conserve scarce water resources, and minimize salinization and waterlogging.

International Center for Agricultural Research in the Dry Areas (ICARDA)
Headquarters: Aleppo, Syrian Arab Republic
www.icarda.org

ICRISAT: Big Gains in Small Packages

A small fertilizer pack is more affordable for small farmers and easier to handle.

Marketing fertilizer in small packs makes inputs more accessible to small-scale farmers in South Africa and boosts total sales

Progress Milling, the largest miller in Limpopo Province of South Africa, established in 1997 the Limpopo Community Development Program (LCDP) to help coordinate public and private investment aiming to improve agricultural productivity and livelihoods in rural communities of the province. It coincided with the company's investment in rural community depots for the sale of maize and the exchange and purchase of farmers' grains.

In 2003, the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) joined LCDP and began conducting research, funded by the Australian Centre for International Agricultural Research, with the farmers' organization Limpopo Agricultural Strategic Team (LIMPAST) and the Limpopo Department of Agriculture. The partners tested low doses of fertilizer as an investment option for poor farmers in drought-prone regions. Fertilizer had been sold in Progress Milling depots only in the traditional 50-kilogram (kg) pack. To complement the fertilizer research, Progress Milling, LIMPAST and ICRISAT approached the chemicals firm Sasol Nitro in 2004 with the proposal that it become a financial partner in LCDP and supply fertilizer for sale at Progress Milling depots. ICRISAT proposed testing the sale of smaller 10- and 20-kg packs in addition to the traditional 50-kg pack, in line with the philosophy of providing farmers the choice of buying small packs and as a more appropriate strategy for marketing fertilizer to poor farmers.

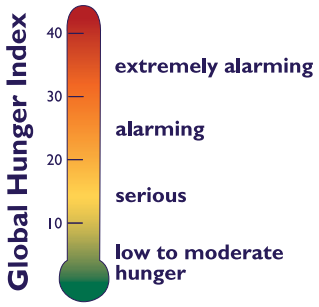
Sasol Nitro proceeded to register 10- and 20-kg packs of starter and top-dress fertilizer, and in the 2005-2006 season supplied Progress Milling with the three pack sizes. The Sasol agronomist helped conduct demonstration trials with farmer groups. As a member of the LCDP, Pannar Seeds supported the marketing trial with small packs of maize and sorghum seed for sale at the depots. Results show that, in villages where farmers were familiar with fertilizer, sales of 50-kg bags dominated. However, in villages where fertilizer use was uncommon, 99% of sales were in small packs, with 10-kg packs preferred to 20-kg packs. Fertilizer sales through Progress Milling depots rose from a 5-year plateau of 85 tons per cropping season to 100 tons in 2005-2006. Pannar Seeds reported an additional 20 tons of seed sales in the province.

As if to ratify the success of this partnership, Progress Milling, Sasol, Pannar and LIMPAST are jointly funding the new position of development coordinator to supervise the sale and distribution of seed and fertilizer at Progress Milling depots and to support field research with smallholder farmers conducted by LIMPAST and ICRISAT. Further, Sasol Nitro is providing a grant to support the provincial agronomist's master's degree based on evaluating small doses of nitrogen and phosphorus fertilizer for poor farmers in drought-prone regions.

International Crops Research Institute for the Semi-Arid Tropics (ICRISAT)
Headquarters: Patancheru, India
www.icrisat.org

IFPRI: Spurring Action Against Hunger

The adoption of the Millennium Development Goals has placed hunger and poverty at the top of the global development agenda, with the target of cutting hunger in half by 2015. To further call attention to global hunger, the International Food Policy Research Institute (IFPRI) marked World Food Day in October 2006 with the release of its Global Hunger Index (GHI), an innovative and enhanced approach for measuring hunger in developing and transitional countries. The index reveals hunger hotspots, shows which countries and regions have improved over time, and demonstrates the links between hunger and violent conflict.



The index shows which countries have not used available resources to alleviate undernutrition.

Designed to mobilize political will and promote good policies by ranking countries and illustrating trends, the index captures three dimensions of hunger: insufficient availability of food, shortfalls in child nutrition and child mortality. The index ranks countries in the years 1981, 1992, 1997 and 2003 to measure their progress over time. The current hotspots of hunger and undernutrition are in South Asia and sub-Saharan Africa, with some other countries such as Cambodia also showing alarmingly prevalent hunger.

The new Global Hunger Index helps civil society and parliamentarians evaluate progress in the fight against hunger — and publicize failure

The index was released in partnership with the nongovernmental organization German Agro Action, which held a press conference in Germany to complement an international press briefing organized by IFPRI. The press activities resulted in more than 60 media hits in 17 developing and 10 developed countries, ultimately influencing governments and key decision-makers. The index also empowered international agencies and civil society organizations, which use the data to focus attention on severe hunger in particular countries. German Agro Action uses the index for its advocacy efforts in Germany and in developing countries where it run projects.

India's poor GHI ranking and lack of improvement from 1997 to 2003, despite favorable economic trends, stirred considerable debate in that country. Publicity about the GHI culminated in action by the Indian Parliament, which contacted IFPRI seeking more information about India's poor performance. Members of Parliament also confronted the minister of consumer affairs, food and public distribution and the minister of women and child development with questions about the country's hunger and child malnutrition problems.

In Malawi, the ministers of agriculture and of economic planning and development granted press interviews regarding the country's poor GHI ranking. The World Food Programme quoted the index in a statement decrying cutbacks in food aid for children and sufferers of AIDS and tuberculosis in Cambodia.

One benefit of the index is to indicate which countries have not used available economic resources effectively to alleviate undernutrition. Several countries do worse than expected on the index relative to their gross national income per capita. Countries with high HIV infection rates scored poorly relative to their level of economic development, highlighting the links between AIDS and hunger.

By developing and publicizing the GHI, IFPRI's ultimate goal is to speed progress in the fight against hunger. Ultimately, merely cutting hunger in half cannot provide satisfaction. Hunger must be eradicated completely.

IFPRI

International Food Policy Research Institute (IFPRI)
Headquarters: Washington, D.C., United States of America
www.ifpri.org

IITA: Take the Bitter *from* the Sweet

A British television documentary alleged in 2000 that 90% of the cocoa exported from Côte d'Ivoire was produced using child slaves. This and similar reports prompted the International Institute of Tropical Agriculture (IITA) to conduct an investigative survey of cocoa producers in West Africa. The research was supported by the United States Agency for International Development, US Department of Labor, World Cocoa Foundation and International Labor Organization, as well as the governments of Cameroon, Côte d'Ivoire, Ghana and Nigeria.

Sensitization conducted in cocoa farmer field schools lowers the rate of child labor.

Although the study documented no instances of slavery, it did find hundreds of thousands of children at risk performing hazardous tasks on cocoa farms. To address this problem, chocolate manufacturers have supported a program designed to stem child labor.

Cocoa is grown mostly on small family farms in West Africa, where children have traditionally worked in agriculture as part of the family unit.

A study of child labor conditions among cocoa producers in four West African countries guides action to stem abuses

The study found that farm families provided all the labor on 31% of the cocoa farms in Côte d'Ivoire, 23% in Cameroon, 17% in Ghana and 10% in Nigeria. In Côte d'Ivoire, 87% of permanent labor in cocoa farming came from the family, with children providing 24% of household labor.

Some 200,000 children in Côte d'Ivoire, and another 84,000 children in the three other countries, were found to be performing such hazardous tasks as using machetes and applying pesticides without protective equipment. Even more disturbingly, the study reported that about 12,500 children working on cocoa farms had no relatives in the area, which suggests that many of them had been trafficked.

In Côte d'Ivoire, one-third of school-age children living on cocoa farms have never attended school. Children working in all cocoa farming tasks were found to be barely half as likely to be enrolled in school (34% enrolled) as children who did not work (64% enrolled).

In response to these findings, the Sustainable Tree Crops Program (STCP) of IITA incorporated child labor sensitization protocols in its farmer field school training curriculum for cocoa farmers. These protocols were refined and tested with over 15,000 cocoa farmers from 2003 to 2006 and are now in the farmer field school curriculum manual for West African cocoa producers.

The outcome of sensitization was revealed by a study in Ghana that compared 350 cocoa farmers trained in farmer field schools with 200 nonparticipating farmers. Among participants, the incidence of child labor was 18% lower than in the control group. Encouraged by this result, STCP and national partners intend to scale up farmer field schools over the next 5 years.

STCP also developed training modules on child labor for cocoa marketing cooperatives, which were tested with 127 organizations in Côte d'Ivoire. In addition, on the basis of the study findings, a US$5 million child labor sensitization and remediation program was implemented across West Africa from 2003 to 2006 by the West Africa Commercial Agriculture Program of the International Labor Organization, with the support of the World Cocoa Foundation and the US Department of Labor.

IITA
Research to Nourish Africa

International Institute of Tropical Agriculture (IITA)
Headquarters: Ibadan, Nigeria
www.iita.org

ILRI: Live Vaccine Outlives Doubts

Demonstrating its safety and affordability renders a live vaccine for East Coast fever available to thousands of African cattle herders

Veterinary service providers in Tanzania and Kenya are widely deploying a live vaccine proven to be safe and effective against East Coast fever. The deadly cattle disease destroys smallholder livelihoods and costs Africans up to US$300 million a year. The vaccine, produced by the International Livestock Research Institute (ILRI) a decade ago, had been used until recently only in Tanzania because veterinary authorities in Kenya and elsewhere demanded evidence of its safety.

Using live vaccine is an infection-and-treatment method of immunization. It involves injecting cattle with a dose of live but weakened parasites along with a long-acting antibiotic that keeps the disease from developing. Past attempts to promote this immunization method failed because there were doubts that it could be delivered safely in the field or that it would be affordable to poor livestock herders. Then a private vaccine supplier called VetAgro Tanzania began protecting Maasai cattle against East Coast fever with the vaccine, demonstrating not only that the live vaccine can be safely delivered under pastoral conditions, but also that a huge demand exists among poor pastoralists to purchase it. Demand was so strong, in fact, that 4,000 Kenyan nomadic herders drove their cattle across the border to get their animals vaccinated in Tanzania.

Safely delivered live vaccine reduced calf mortality in the herds of poor pastoralists to less than 2%.

Beginning in 2002, ILRI helped to gather independent evidence on the use of the vaccine in Tanzania, which demonstrated that the vaccine was safe and effective, that herders wanted it, and that it could be administered safely in the field. The safety and efficacy results from the studies led to regulatory approval and widespread adoption in Tanzania. Noting the effective use of the method in Tanzania, Kenyan pastoralists lobbied their government to allow them to use it. In response, the Kenya Veterinary Department asked Veterinaires sans Frontiers Germany and the Loita Development Foundation to test the infection-and-treatment method using the ILRI methodology and, subsequently, approved its use in pastoral areas of Kenya. The African Union InterAfrican Bureau for Animal Resources is ensuring that the findings from Kenya reach the rest of the region afflicted by East Coast fever.

As a result of this project, live vaccine demand has increased dramatically. VetAgro Tanzania has requested 120,000 doses for 2007 and 240,000 doses in 2008. This and demand in Kenya and other countries in East Africa will deplete vaccine stocks and require ILRI to produce more. Private companies in Kenya and the Global Alliance for Livestock Veterinary Medicines are keen to commercialize the vaccine through a private-public partnership.

The project reduced calf mortality among poor pastoralists to less than 2% and the cost of tick control by 50-75% while increasing livestock sales and prices. Pastoral households invested their new income from livestock in their children's education and health, in improving their cattle breeds, and in accessing more and better livestock health services.

ILRI

International Livestock Research Institute (ILRI)
Headquarters: Nairobi, Kenya; Addis Ababa, Ethiopia
www.ilri.org

IRRI: Farmers Teach One Another

Dr. Tran Thi Thu Ha covers a lot of ground. As program coordinator for a dynamic approach to nutrient management called site-specific nutrient management (SSNM), she organizes provincial and regional workshops and training for rice farmers, researchers, nongovernmental organizations and extension workers. Six-hour train rides and bumpy motorbike trips are routine as she meets with local authorities to explain the program and teach farmers how to apply and adapt the technology to their specific field conditions.

Dr. Tran Thi Thu Ha, at far left, spreads the word about site-specific nutrient management in central Vietnam.

"Being an SSNM program coordinator is rewarding because farmers are very happy to benefit from the program," explains Ha, a soil scientist who heads the Soil Science and Environment Department at the Hue University of Agriculture and Forestry in central Vietnam. "It isn't easy to be a good coordinator, but Dr. Roland Buresh and Ms. Marianne Samson always support me with their help, which is why I am able to do my duties well."

"I want to establish a network of farmers interested in conserving soil fertility and protecting the agriculture environment by using balanced fertilizer application," says Ha. "This will help ensure sustainable agricultural development in central Vietnam."

Facilitating exchanges from farmer to farmer disseminates site-specific nutrient management to boost rice yields and farm income

Buresh and Samson run the Irrigated Rice Research Consortium's Productivity and Sustainability Work Group at the International Rice Research Institute, which helped launch SSNM activities in central Vietnam in the first rice-cropping season of 2005.

Ha began by introducing new farmer-implemented techniques in a farmers' cooperative in Huong Tra District of Thua Thien-Hue Province and by teaching farmers to diagnose their fields' particular nutrient deficiencies and fertilizer needs. Four more cooperatives soon became interested and, in 2006, formed a club in which they share information on nutrient and crop management for rice. Some farmers have stopped using insecticide and fungicide, as appropriate nutrient treatment has reduced insect infestation and disease.

Farmers from the club in Thua Thien-Hue traveled to the neighboring provinces of Quang Nam and Binh Dinh to share with other farmers and local leaders their experiences with improved nutrient and crop management, as well as with farmer-implemented experimentation and information sharing through clubs. Two clubs subsequently formed in Quang Nam, and additional clubs are anticipated in Binh Dinh in 2007.

In 2007, the project will help farmers' clubs augment improved nutrient and crop management with water-saving techniques. Farmer workshops and meetings will aim to spread the technologies to neighboring villages, districts and provinces through farmer-to-farmer exchange.

Optimal timing and rates of fertilizer application as practiced under SSNM bring large yield increases over traditional farmers' practice. In northern Vietnam, farmers practicing SSNM in major rice-growing areas realized a net benefit of US$150 per hectare per year. In southern India, farmers who followed the recommended practices raised their annual income by $168, or 48%. In the Philippines, farmers got an extra $106 (10%) and, in southern Vietnam, $34 (4%).

IRRI

International Rice Research Institute (IRRI)
Headquarters: Los Baños, Philippines
www.irri.org

IWMI: Recognized Down on the Town

A new Farmers' Day award helps focus attention on the benefits and challenges of urban and peri-urban agriculture in West Africa

The 2006 Farmers' Day celebrations in Ghana, West Africa, honored — for the first time in 22 years of Farmers' Day celebrations — the country's best urban and peri-urban farmer. This resulted from long-term efforts under the coordination of the International Water Management Institute (IWMI) to encourage official recognition of urban and peri-urban agriculture and its significance. IWMI's goal has been to contribute to urban poverty reduction, urban food security and improved urban environmental management by helping municipal authorities recognize the benefits of urban agriculture while addressing its challenges.

Urban agriculture creates opportunities for recycling urban waste to fertilize soil.

In and around West African cities, about 20 million people currently work in urban and peri-urban agriculture (UPA), which includes producing, processing and marketing such foods as fruit, vegetables, eggs, dairy products, meat and fish, as well as other agricultural products like ornamental plants, seedlings and herbs. These activities provide livelihoods to poor communities and help sustain urban food supplies. Worldwide, 800 million farmers are engaged in urban agriculture, meeting 15-20% of the world's food needs. However, urban and peri-urban agriculture have been missing from urban planning in West Africa.

IWMI has since 2001 been studying the benefits and risks of UPA. These results have been fed into the global network of Resource Centers on Urban Agriculture and Food Security (RUAF), in which IWMI is responsible for work in India and Anglophone West Africa. Under the RUAF umbrella, IWMI started in 2005 an approach in West Africa that brought together many sectors and sought to integrate urban and peri-urban agriculture into the strategic plans of municipal authorities in Ghana, Sierra Leone and Nigeria. In the same year, IWMI co-organized a multi-stakeholder forum and policy seminar in Ghana with that country's Ministry of Food and Agriculture. A main discussion point was how to balance the benefits of UPA with such challenges as reducing health risks where polluted water is used for irrigation. The results included a declaration of political support for urban and peri-urban agriculture, the release of a statement of consensus, and the ministry's promise to institutionalize recognition of the country's best UPA farmer.

Farmers' Day is a national holiday in Ghana, celebrated on the first Friday in December, during which the president honors Ghana's best farmers and fishers. It is a major motivational event for the entire agricultural sector, with prizes including houses and cars. Thanks to a concurrent effort, UPA irrigated agriculture is now recognized in city planning for Accra, the national capital, and accepted as a form of "informal irrigation" in the new national irrigation policy currently awaiting cabinet approval.

IWMI's project partners include government departments for food and agriculture, urban planning, public health, and environment. Other partners are nongovernmental and community-based organizations, the Food and Agriculture Organization of the United Nations, the World Health Organization, research and training institutes, farmer organizations, and development agencies.

IWMI International Water Management Institute

International Water Management Institute (IWMI)
Headquarters: Battaramulla, Sri Lanka
www.iwmi.cgiar.org

World Agroforestry: Contours of Innovation

The Landcare approach has enabled thousands of farm households in the Philippines to diversify livelihood options, strengthen local environmental governance, and improve their access to financial and technical assistance. Landcare develops the skills and capacities of rural communities to address land degradation and other concerns. It is a process of building partnerships among development agents, farmers and local governments so that they can identify and implement their own solutions to problems.

The World Agroforestry Centre (ICRAF) began in 1996 to scale up improved agroforestry and conservation farming technologies in the uplands of Mindanao. A decade later, more than 8,000 farmers are active in more than 600 Landcare groups across Mindanao and the Visayas.

In the late 1980s and early 1990s, the International Rice Research Institute (IRRI) had promoted contour hedgerows in Clavaria, northern Mindanao. But most farmers could not afford the labor and input costs of establishing them. A more labor-efficient technology was needed, and farmers are credited with identifying the concept of natural vegetation strips.

Farmers too poor to plant hedgerows simply plowed around the marking sticks, and terraces started to form within a year.

"IRRI technicians gave sticks to the farmers, asking them to place them on the contours ready for planting hedgerows," recalls Marcelino Patindol, a pioneer Landcare farmer in Clavaria. "Farmers unable to buy the planting materials just left the sticks in the ground and plowed around them. As grass grew around the sticks, terraces started to form within a year."

Having begun a research program in the same area in 1995 to document how well natural vegetation strips control erosion and conserve soil, ICRAF found that they provided an ideal niche for a variety of agroforestry options including banana and durian trees and timber-bearing eucalyptus and gmelina trees. Importantly, farmers began taking up the techniques spontaneously, adapting them to agro-ecological situations. As the methods began to spread, demand quickly grew for training and material input support for establishing community and on-farm nurseries. ICRAF provided the research needed to identify appropriate tree species and other support functions. Not surprisingly, training often determined which farmers actively adopted the new methods and which decided to wait and see.

A multiyear project funded by the Spanish Agency for International Cooperation allowed the consolidation of knowledge and expanded support activities into other regions such as the Visayas.

Hillside hedgerows originally intended to control erosion are adapted to diversify farmers' income and foster community cohesion

In recent years, several ICRAF graduate fellowships have focused on adoption and impact surveys that have deepened understanding of how Landcare provides essential mobilizing capacity and incentives for testing and adapting new technologies.

ICRAF, working closely with many institutions, has helped bring a sea-change in the way thousands of Philippine farmers manage their fields. It has helped build a locally empowering institutional base, the Landcare Foundation, which will sustain research, extension and training efforts over time and promote policies that foster a transition from the destructive plowing of steep slopes to soil-conserving methods and diversified tree-based farming systems.

World Agroforestry Centre
TRANSFORMING LIVES AND LANDSCAPES

World Agroforestry Centre (ICRAF)
Headquarters: Nairobi, Kenya
www.worldagroforestrycentre.org

WorldFish: Fostering a Feast for the Eyes

The rivers that course though the rainforest of southern Cameroon hold the key to promoting small-scale enterprise able to break the cycle of poverty and environmental degradation. The WorldFish Center and its partners are developing and refining environmentally friendly techniques for farming ornamental fish and helping to establish village fishery-management entities empowered to ensure the fair valuation and protection of local forest aquatic resources.

Most wild forest products are, like timber, prone to overexploitation. Commercially viable production of the few forest products that are cultured typically requires clearing the forest. In contrast, aquaculture systems that depend on natural nutrient cycles mesh with the forest, as minimal modifications to streams expand the habitat conducive to natural spawning and juvenile survival. This provides wild brood stock that ensures the genetic integrity of the cultured fish and shrimp and offers strong incentives for forest dwellers to conserve rivers and streams.

As fishing is traditionally a women's activity, households headed by women stand to benefit the most.

Ornamental fish culture provides a high-value livelihood option for vulnerable groups in the rainforests of sub-Saharan Africa

More than 200 species of valuable ornamental fish live in the rivers of the Lower Guinean rainforest, though individuals of these colorful species are rare. In recent years, the wasteful exploitation and callous shipping of ornamental fish — almost entirely for the profit of foreign middlemen — has seen 85% of the fish perish before reaching overseas markets. This project has helped establish a public-private partnership to enter and help reform the international trade in ornamental fish.

Farming ornamental fish has the potential to provide innovative and sustainable livelihood options for 8 million residents of riverine ecosystems in the Lower Guinean rainforest of Cameroon, providing alternatives to slash-and-burn agriculture and illegal logging. Success here could serve as a model for 20 million people in the neighboring Central African rainforest, who face similar challenges and opportunities. As fishing is traditionally a women's activity, the women and children of the most vulnerable households, especially those headed by women, stand to benefit the most.

The immediate plan is to expand and strengthen the work on ornamental fish aquaculture along three forest rivers in south-central Cameroon; train fishers in aquaculture technology; establish sustainable fishery-management entities in five villages home to more than 4,000 people; and improve scientific documentation of rainforest fish biodiversity, ecology and reproduction. For focus, the project will conduct an expert workshop and produce a synthesis on rainforest river ecology and management.

Importantly, the project empowers forest communities to monitor and report on their forest aquatic resources, advocate and justify their fair valuation and protection, and manage and market them responsibly and sustainably.

WorldFish's main partners in the project are the Organization for Environment and Sustainable Development, a Cameroonian civil society organization dedicated to sustainable development, and Gulf Aquatics, a small Cameroonian trading company that has already reduced fish mortality in shipments to Europe. At the heart of the partnership are the village fishery groups that are fully engaged in every step of developing a market chain that stretches from their ponds and rivers to the aquariums of the West.

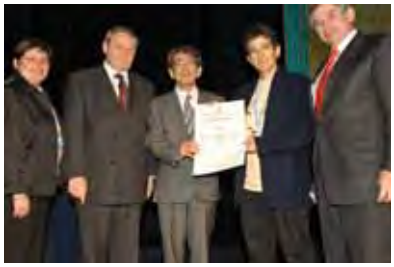
WorldFish CENTER

WorldFish Center
Headquarters: Penang, Malaysia
www.worldfishcenter.org

Innovation THROUGH Partnership

Science Awards: Recognizing Excellence in 2006

The ceremony presenting the Science Awards of the CGIAR at its Annual General Meeting is a welcome opportunity for the System to recognize excellence and achievements in agricultural science and science communication. The awards both celebrate and augment the motivation that drives agricultural research scientists in both the laboratory and the field. The following are the winners of the 2006 CGIAR Science Awards:



The International Maize and Wheat Improvement Center (**CIMMYT** by its Spanish acronym) received the prestigious **CGIAR King Baudouin Award** for its research on stress-tolerant maize for food security, livelihoods and sustainable development in sub-Saharan Africa. CIMMYT took the lead in abiotic stress research by using managed stress environments, formulating applied and practical breeding approaches, and demonstrating significant breeding progress under highly variable random stress conditions in one of the largest plant breeding experiments ever undertaken in Africa. The approach is a low-cost methodology appropriate for national agricultural research systems in the developing world. Through CIMMYT's African Maize Stress Project and South African Drought and Low Soil Fertility Project, 44 stress-tolerant hybrids and 29 open-pollinated varieties of maize are benefiting thousands of farmers in eastern, central and southern Africa.

Achievements are honored in improving and protecting maize, pearl millet, sorghum, banana and cowpea; compiling genebanks and virtual libraries; sequencing a cattle pathogen; and promoting a healthy diet

Dr. **Ram P. Thakur**, an Indian national and a senior plant pathologist at the International Crops Research Institute for the Semi-Arid Tropics, won the **Outstanding Scientist** award for his significant contributions to managing disease in pearl millet and sorghum, two important cereal crops in the semi-arid tropics of South Asia and sub-Saharan Africa. His most outstanding contribution in recent years has come through a project with the Indian Council for Agricultural Research in which he successfully monitored the change in virulence of a pathogen population. His work helped breeders to develop pearl millet hybrids with durable resistance to downy mildew, an extremely destructive disease. This strategic research has aided in avoiding epidemics and so prevented huge economic losses.

Dr. **Thomas Dubois**, a Belgian scientist at the International Institute of Tropical Agriculture, was the recipient of the **Promising Young Scientist** award for his work on the biological protection of bananas from pests and diseases. Dubois has developed tissue culture banana plants that are protected by beneficial strains of fungal endophytes. He excels at delivering this product to the farmers, partly by establishing public-private partnerships, as well as by maintaining a high standard of scientific excellence. Banana is a key staple in Uganda, where Dubois is posted, and other countries in East and Central Africa.

Dr. **Bir Bahadur Singh**, an Indian national and plant breeder at the International Institute of Tropical Agriculture from 1979 to April 2006, was the **Outstanding Senior Scientist** awardee for his research in cowpea that led to the development of several improved varieties, sustainable cropping systems and participatory approaches that contributed to enhanced food security, family nutrition and income for farmers in the tropics. His major contributions have been early maturing cowpea varieties for the tropics and pyramiding genes for resistance to over 10 diseases, as well as tolerance to drought and heat. Key to this success has been his skill in team building and forging effective partnerships among scientists from different research institutions.

The **CGIAR Genebank Community** won the **Outstanding Partnership** award for its effective stewardship of genetic resources, which are public goods central to the work of the CGIAR and its partners. The genebanks are repositories of over 600,000 accessions of some 3,000 staple crop, forage and agroforestry species essential to human food security and nutrition. Jane Toll, coordinator of the Systemwide Genetic Resources Program (SGRP) at Bioversity International, received the award on behalf of the community, which includes the genebanks of 11 CGIAR Centers as well as the Food and Agriculture Organization of the United Nations, International Food Policy Research Institute, and SGRP (see page 15).

CGIAR Centers that Manage Genebanks

Africa Rice Center (WARDA)
Bioversity International
International Center for Tropical Agriculture (CIAT)
International Maize and Wheat Improvement Center (CIMMYT)
International Potato Center (CIP)
International Center for Agricultural Research in the Dry Areas (ICARDA)
International Crops Research Institute for the Semi-Arid Tropics (ICRISAT)
International Institute of Tropical Agriculture (IITA)
International Livestock Research Institute (ILRI)
International Rice Research Institute (IRRI)
World Agroforestry Centre (ICRAF)

The **CGIAR Virtual Library Team** received the **Outstanding Scientific Support Team** award for launching and supporting the CGIAR Virtual Library. By bringing together CGIAR and external resources in one place, the library has significantly facilitated researchers' access to knowledge and is therefore greatly contributing to the strengthening of agricultural research capacity. The Virtual Library is part of the CGIAR's Information and Communication Technologies–Knowledge Management Investment Plan, which is supported by the World Bank. Luz Marina Alvaré, the CGIAR Virtual Library Team leader and head of library and knowledge management for the International Food Policy Research Institute, received the award on behalf of the team.

The **Outstanding Scientific Article** was awarded to ***Genome Sequence of* Theileria parva*, a Bovine Pathogen that Transforms Lymphocytes***, by **Malcom J. Gardner et al**. Published in 2005 in the journal *Science*, this contribution from The Institute of Genomic Research (TIGR), International Livestock Research Institute (ILRI) and five partner institutions represents a significant advance in understanding the biology of the parasite critical to the development of a vaccine against the East Coast fever, a disease that kills 1 million cattle each year in sub-Saharan Africa. Given the pathogen's close kinship with the malaria parasite, the research work could also provide a valuable contribution to the global program to develop a vaccine against malaria. Vish Nene of TIGR and John McDermott of ILRI received the award on behalf of the authors.

Patrick M. Maundu of the African Leafy Vegetable Project was the winner of the **Outstanding Communication** award. The winning piece was in support of the campaign to increase the consumption of nutritious African leafy vegetables for better nutrition. The project is coordinated by Bioversity International and implemented in partnership with public and private organizations in Kenya. As a result of the project's communication initiatives, sales of leafy vegetables increased 11-fold in 2 years. Ruth Raymond, head of the Public Awareness Unit of Bioversity International, received the award on behalf of Maundu.

Generation Challenge Programme: National Scientists Take the Lead

One project to improve peanut and another to understand aluminum tolerance illustrate Brazilian strength in genomic research collaboration

Dr. Abraham Blum (right), curator of Plantstress.com, tours a sorghum trial with Dr. Frederico Durães, the plant physiologist managing an Embrapa-led Generation project supporting the emergence of phenotyping centers of excellence for drought tolerance.

The Generation Challenge Programme (GCP) brings partners together in a network for research and capacity building in crop science. The network draws on plant genetic diversity, advanced genomic science and comparative biology to develop tools and technologies that enable plant breeders in the developing world to produce better crop varieties for poor farmers.

The GCP links upstream basic research with downstream applied science by positioning itself midstream, thus ensuring that innovations flow freely to serve plant breeding for poor farmers. This objective can be achieved only through collaboration in plant science that is multinational, multisectoral and multidisciplinary.

The 22 current members of the consortium include nine Centers supported by the CGIAR, seven national research institutions and six advanced research institutions. The consortium members' additional partners include more than 25 advanced research institutions in the North and South and 30 national research institutions. Some of the GCP's key partners are its stakeholders, who help identify research priorities and so ensure that the products resulting from research projects truly serve users.

One of the GCP's most fruitful collaborations is with the Brazilian Agricultural Research Corporation (Embrapa by its Portuguese acronym). Embrapa coordinates Brazil's National Genetic Resources Network, which provides an integrated system of curatorship for 235 genebanks that together hold more than a quarter of a million accessions of plant and animal germplasm. Embrapa leads or otherwise participates in several GCP projects that highlight the GCP's goal of accessing genetic diversity and using cutting-edge science to create useful breeding tools.

One such project is "Unlocking the genetic diversity in peanut's wild relatives with genomic and genetic tools," whose tightly focused research agenda is executed by a world-class scientific team led by scientists from Brazil working with colleagues from Argentina, Denmark, France, India and Senegal. New genes have been introduced into peanut cultivars and, in 2006, were tested to isolate the sources of the ability to withstand all manner of stresses. New lines that resist leaf rust have been identified.

Embrapa scientists are active in revealing the genetic basis of aluminum tolerance in various crops, which will boost their productivity in acid soils. By running an analysis that integrates functional genomics, molecular genetics and physiology, a project teaming Embrapa with Cornell University has identified a major gene for aluminum tolerance in sorghum. To follow up, the GCP supports an Embrapa-led project to identify superior alleles of the aluminum-tolerance gene for breeding programs. The project will improve germplasm for South America and Africa.

The GCP uses crop diversity and promotes biotechnology for breeding, as illustrated by the projects mentioned above. It nurtures broad-based partnerships to harness cutting-edge science within and beyond the CGIAR to produce improved germplasm for breeding cultivars for small-scale farmers. To achieve its objectives, the GCP relies on highly efficient partnerships such as that with Embrapa.

HarvestPlus Challenge Program: Novel Foods Forge Novel Partnerships

The Eat Orange! campaign promotes vitamin A-rich orange-fleshed sweetpotatoes.

Foods rich in beta-carotene find favor where they are needed, as plant breeders join forces with health and marketing experts

In many developing countries, public health nongovernmental organizations (NGOs) play a crucial role in improving the health of the poor. In parts of sub-Saharan Africa, for example, NGOs provide more than 20% of healthcare services to the poor, especially to households and local communities. Given their effectiveness in reaching underserved populations with interventions that are driven by health concerns, public health NGOs and similar civil society organizations are critical partners to HarvestPlus in fulfilling its mission to reduce micronutrient malnutrition among the poor.

The process begins with the development of new varieties of staple food crops biofortified to be rich in micronutrients that the human body can readily metabolize. Actually reducing micronutrient malnutrition requires the Challenge Program not only to support the development of these new varieties but also to convince farmers to grow them, and poor households and communities to consume them. HarvestPlus has teamed up with national and international NGOs working in public health in Uganda and Mozambique to create demand in households and communities for nutritious biofortified staple crops.

One such partnership is Eat Orange!, a strategic alliance combining HarvestPlus, International Potato Center (CIP by its Spanish acronym, see page 27), World Vision and Helen Keller International (HKI) in an effort to reduce vitamin A deficiency in Mozambique, where the health of 68% of children is thought to be affected, the worst cases leading to blindness and even death. The partnership promotes the cultivation and consumption of new varieties of orange-fleshed sweetpotato (OFSP) that are rich in beta-carotene, which the body converts into vitamin A.

As these new varieties are developed by CIP and its national agricultural research partners, World Vision ensures that systems of agricultural extension, product marketing and demand creation are in place to get these new varieties into the communities most in need of them. World Vision has experience working in Mozambique since 1984, when it provided relief from drought and famine in a grinding civil war. Since that conflict ended, World Vision has deepened its commitment to Mozambique by implementing projects that focus on health and nutrition, among other needs, and partnering with local and international NGOs to improve food security.

HKI, an NGO known for its work on vitamin A nutrition and blindness prevention, works with World Vision to test specific health-communication strategies to generate community demand for OFSP in target regions. HKI applies proven health-delivery models, honed while disseminating other nutrition interventions, to the new biofortified crops developed by HarvestPlus. Such techniques have been especially effective in countries with highly constrained healthcare infrastructure such as Mozambique. In other regions, HKI is scaling-up OFSP production, dissemination and consumer education to promote OFSP in targeted communities. For these efforts, HKI received one of four $30,000 partnership awards at the third Innovation Marketplace of the CGIAR in 2006 (see page 19).

Challenge Program for Water and Food: Making a River Basin a Community

The Challenge Program on Water and Food (CPWF) is a multi-institutional research-for-development initiative that seeks to develop technological, institutional and managerial innovations in the field of water and agriculture, and so expand and reinforce food security, improve livelihoods and leave more water for other users and environmental conservation.

To accomplish its tasks, the CPWF weaves an intricate partnership network. Each of its five themes is led by a research Center supported by the CGIAR. Meanwhile, activities in each of its nine benchmark river basins are coordinated by a basin-based institution. Moreover, projects are required to forge multiple partnerships with agencies within the target basins to qualify for CPWF funding. This emphasis on partnerships is the principal means by which the CPWF strives to translate its research findings into significant developmental impact. An impressive total of 198 institutions participated directly in CPWF's 52 projects in 2006, augmented by uncounted indirect partnerships.

Feedback on 33 first-call projects indicates that innovative partnership networks combining research and development institutions; national, provincial and local governments; nongovernmental organizations (NGOs); and farmers are changing the ways in which research is carried out, as well as strengthening research results and fostering positive change at the basin level. Research achievements arising from networks are most notable in projects on coastal resource management, groundwater governance, collective action across scales in upper watersheds, and integrating governance and modeling.

CPWF small-grant projects have proved excellent at effectively linking researchers to examples of genuine impact. The 14 projects aim to identify existing small-scale or local water and/or agricultural management strategies that have potential to improve water productivity at some wider scale. Relationships built among research networks, NGOs and local communities share knowledge and build capacity for future change. Small-grant project representatives participated in several prominent events during 2006, including the Civil Society-CGIAR Forum at the CGIAR Annual General Meeting 2006.

A revised strategy for CPWF capacity building was approved in April 2006. The new strategy was field-tested through workshops on stakeholder needs assessment held in the Limpopo, Volta and Nile river basins in the later half of 2006. Throughout the year, the CPWF capacity-building initiative supported the research of 163 students from 24 countries — numbers set to expand in 2007.

The CPWF International Forum on Water and Food took place in November 2006 with 245 participants from 32 countries coming together to build partnerships and exchange ideas. The forum was hailed as an enormously successful experiment, designed to move away from standard presentation formats by presenting knowledge before the event and then debating and synthesizing it. Participants' commented on the extraordinary energy of the week and described it as a model for future interactions. It resulted in an impressive array of outputs, including the Vientiane Statement, a declaration of vision and strategy on how to improve water and food security.

Crosscutting networks have improved coastal resource and groundwater management and boosted collective action in upper watersheds

Flooded rice and other irrigated agriculture account for 70-90% of water use in developing countries.

Sub-Saharan Africa Challenge Program: 4WD traction for IAR4D

Making headway in African agriculture requires an adaptable program of stakeholder collaboration, responsiveness and business *un*usual

Farmers, researchers and other stakeholders participate in an SSA-CP diagnostic and planning meeting.

The Sub-Saharan Africa Challenge Programme (SSA-CP) aims to demonstrate the potential of integrated agricultural research for development (IAR4D) to address the complex constraints that affect African agriculture.

IAR4D builds on four components: (i) interventions that address the interfaces among productivity enhancement, sustainable natural resource management, efficient markets, and policies and institutions; (ii) working from a value-chain perspective; (iii) taking a watershed or agro-ecosystems approach; and (iv) working through innovation platforms.

Each of these components involves collaboration, often with partners who have heretofore been largely absent, such as input suppliers, farmers' groups, market agents and policymakers.

Partnerships operate in different ways in the three SSA-CP pilot learning sites, in West-Central, East and Southern Africa. In some cases, partnerships are forged across the value chain to ensure that production matches market demands. Elsewhere, stakeholders who share a watershed or agro-ecological zone come together to agree on how to address issues of natural resource management. A cross-cutting goal is to empower end users to drive the research agenda and ensure that research is relevant and translates into impact. To achieve this goal, the SSA-CP invests in capacity building for all partners and envisions working toward organizational change and institution building in African national agricultural research systems to ensure that they are able to respond to stakeholder needs with business *un*usual.

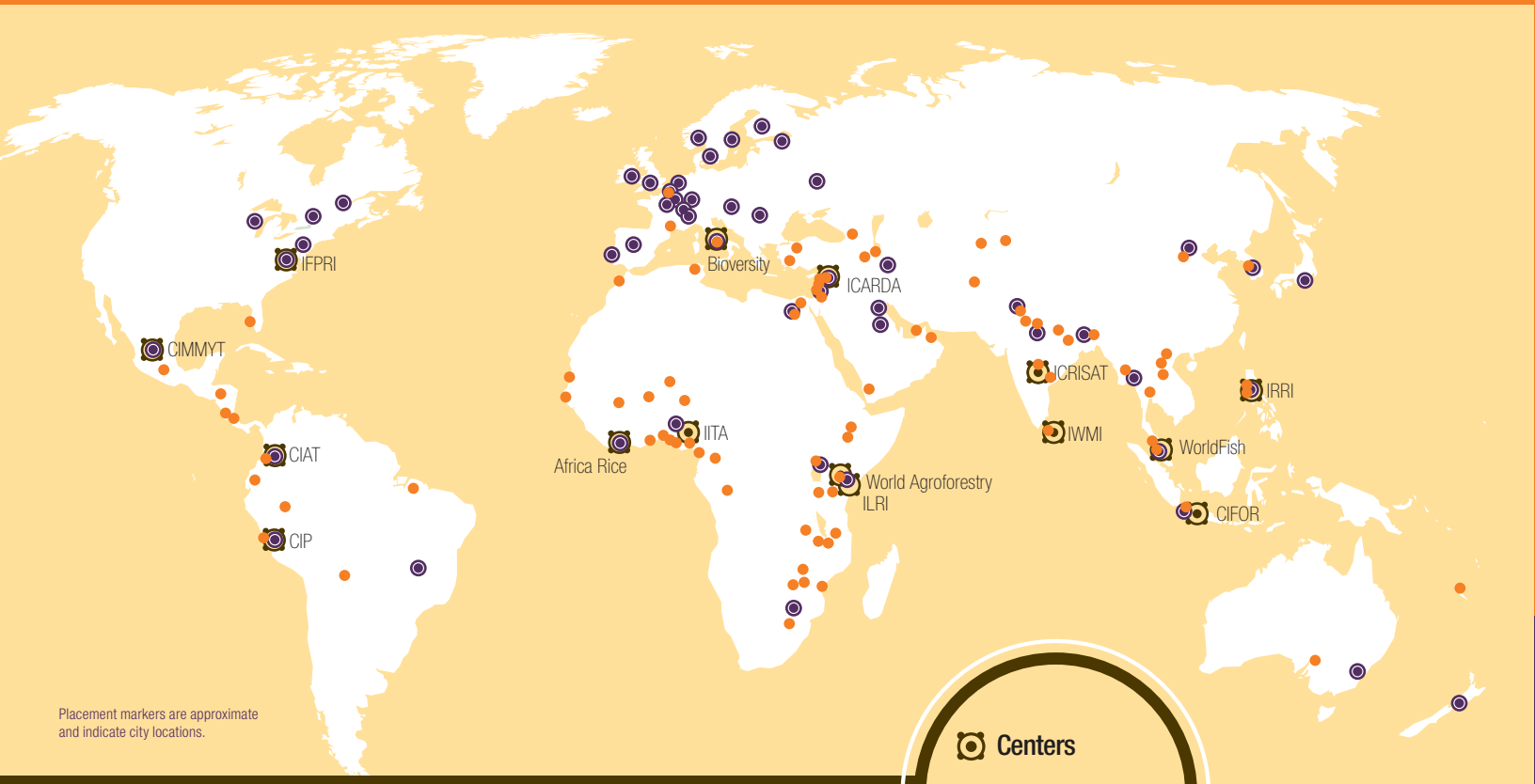
A recent event in the Zimbabwe-Mozambique-Malawi Pilot Learning Site illustrates how innovative partnerships are reshaping the research agenda. A participatory planning meeting in Barue District of Mozambique attracted farmers, nongovernmental organizations, researchers, extension officers and representatives of a private agricultural marketing company. The initial proposal was to promote farmer production and marketing of indigenous vegetables, but farmers voiced a preference for commercial vegetable production for urban markets. The private company at the meeting responded with a proposal for vegetable outgrower arrangements to provide farmers in the region with agricultural inputs and an assured market.

This approach has potential if several constraints can be addressed. These include the provision of irrigation infrastructure and water management, high-quality seed and other inputs, and adequate feeder roads and vehicles. The fragmentation of local markets must be addressed, and market information improved and expanded. Finally, the need exists for fast-tracking the registration of farmer organizations and farmer training, particularly concerning quality standards, the processing of agricultural produce and other value-adding activities.

Because a cross-section of stakeholders attended the planning meeting, the group could quickly identify priority problems and the collaborative arrangements required to address them. As revised by a participatory process, the work plan will cover not only varietal trials but also soil and water management, market and policy issues, and postharvest processing, as well as capacity building, organizational and institutional change, and participatory monitoring and evaluation. Partnerships forged at this stage form the basis for collaborative action in the next.

In short, the SSA-CP's emphasis on stakeholder collaboration is helping to ensure that IAR4D is responsive both to farmers' needs and to market conditions.

A Global CGIAR



CGIAR-SUPPORTED CENTERS

Africa Rice Center (WARDA)
www.warda.org

Bioversity International
www.bioversityinternational.org

International Center for Tropical Agriculture (CIAT)
www.ciat.cgiar.org

Center for International Forestry Research (CIFOR)
www.cifor.cgiar.org

International Maize and Wheat Improvement Center (CIMMYT)
www.cimmyt.org

International Potato Center (CIP)
www.cipotato.org

International Center for Agricultural Research in the Dry Areas (ICARDA)
www.icarda.org

International Crops Research Institute for the Semi-Arid Tropics (ICRISAT)
www.icrisat.org

International Food Policy Research Institute (IFPRI)
www.ifpri.org

International Institute of Tropical Agriculture (IITA)
www.iita.org

International Livestock Research Institute (ILRI)
www.ilri.org

International Rice Research Institute (IRRI)
www.irri.org

International Water Management Institute (IWMI)
www.iwmi.cgiar.org

World Agroforestry Centre (ICRAF)
www.worldagroforestrycentre.org

WorldFish Center
www.worldfishcenter.org

Performance Measurement: Results, Potential and Perceptions

The Performance Measurement System of the CGIAR entered its third year in 2006. Centers are measured in terms of their results and potential to perform in the future — and now by their performance as perceived by stakeholders, including both CGIAR Members and Center partners (table 1).

Research Outcomes. Centers reported their five most significant research outcomes in 2006 in terms of Center outputs generated in 2003-2005 and their external use and adoption by, or influence on, partners, stakeholders and clients. The Science Council assessed and scored Center-reported outcomes (figure 1). Some of the outcomes are highlighted in chapters of this report on individual Centers.

Culture of Impact Assessment. Centers' commitment to documenting their impact and building an impact-assessment culture is measured as part of the Performance Measurement System. The Science Council assessed Centers' reports using three criteria: (i) ex-post impact assessment studies and the advancement of methods for conducting them, (ii) building an impact-assessment culture at the Center, and (iii) communication and dissemination and capacity enhancement. Figure 2 shows the results of the Science Council assessment.

Institutional Health is assessed by measures of Center governance, culture of learning and change, and diversity. The following provides some insight on each of the three components.

Good governance is a critical component of Center performance. It entails (i) adequate composition and structure of Center boards, (ii) effective board practices, (iii) full board engagement with Center's strategic business, and (iii) transparency and accountability.

The following demonstrates some of the critical good governance practices at Centers:

- Fourteen Centers have in place a board-approved investment policy, and 13 Centers have a grievance policy.
- All Centers have a formal code of conduct and/or ethical principles (including conflict-of-interest rules) for staff, managers and board members.
- The majority of the boards discussed or reviewed the Center's human resource policies during 2005-2006 and received or reviewed Center staffing numbers and trends including consultant, gender and diversity information.
- All Center boards conduct annual self-assessments.

The Centers' culture of learning and change is critical to continued research excellence. This includes,

TABLE 1 Performance Measurement Indicators

RESULTS	POTENTIAL TO PERFORM	STAKEHOLDER PERCEPTIONS
Outputs Outcomes Impacts	Quality and Relevance of Current Research Institutional Health Financial Health	(surveyed every 3 years)

FIGURE 1 Science Council Assessment of Outcomes

(0 = lowest, 10 = highest)

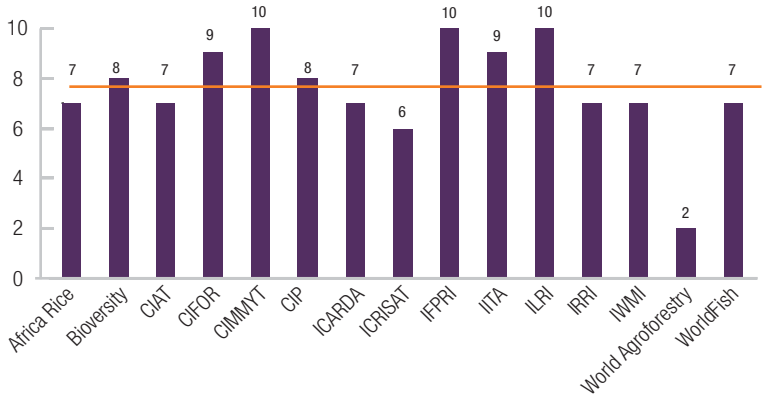
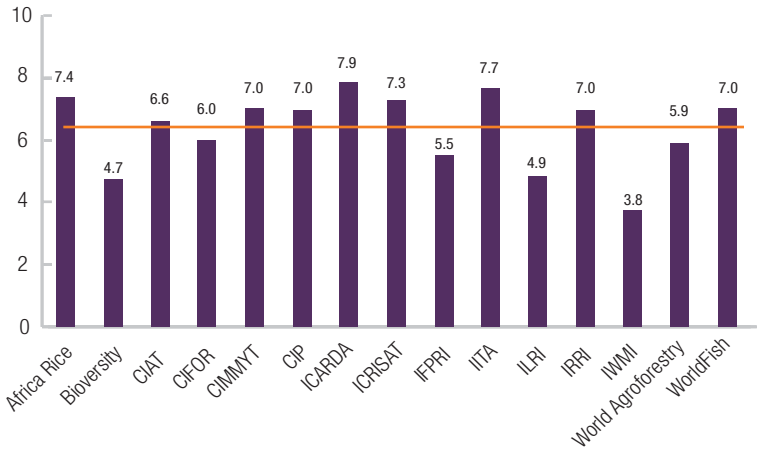


FIGURE 2 Commitment to Documenting Impacts and Building an Impact-Assessment Culture

(0 = lowest, 10 = highest)



among other factors, regular staff surveys; encouraging staff development and offering leadership-development programs for current and prospective staff in managerial positions; regular external reviews of the research program and Center management and governance, including effective follow up; and engagement in new partnerships.

The following illustrates some of the efforts that Centers make as learning organizations striving for excellence:

- A majority of Centers conduct staff satisfaction surveys every other year.
- In 2006, all Centers together engaged in over 300 new and substantive partnerships with external partners, including national agricultural research institutes and civil society organizations.
- Two-thirds of Centers have in place mentoring programs for young scientists.

Leveraging rich staff diversity is vital for the CGIAR's research and management excellence.

The Performance Management System therefore tracks measures of diversity in terms of the nationality of internationally recruited staff (IRS) and gender (table 2).

Financial Health is measured in terms of (i) short-term solvency (liquidity), (ii) long-term financial stability (adequacy of reserves), (iii) efficiency of operations (indirect cost ratio) and (iv) cash management on restricted operations.[1] Figure 3 shows the results for the four indicators.

Stakeholder Perceptions. In 2006, the CGIAR commissioned GlobeScan Inc., a global public opinion and stakeholder research firm, to study the perceptions of its key stakeholder groups (CGIAR Members and Center partners) for the purposes of (i) providing information that is useful and relevant to both the CGIAR and each of the 15 Centers, (ii) providing input to the CGIAR's performance measurement process, and (iii) guiding the development and refinement of stakeholder communication programs.

Respondents who completed the survey numbered 348 and represented a stratified random sample of CGIAR stakeholders. The survey results show that the CGIAR overall has a generally positive reputation among stakeholders. Most CGIAR Members and partners agree that the CGIAR "does an excellent job advancing sustainable agricultural development through research," as shown in figure 3.

The performance indicators for research Centers continue to be refined

While conducting quality research is by far the most important driver of the CGIAR's overall reputation, the survey identified additional areas that both determine the CGIAR's reputation and are opportunities for improvement (figure 4). Areas of concern include perceived "efficiency" and "fair and clear decision-making."

A quadrant analysis of drivers of perceived performance was conducted for each Center. The results show that research is a key strength for all Centers and that areas that influence perceptions and require further focus are (i) partnership, (ii) communication, (iii) transparency about internal processes, decision-making and demonstration of accountability, and (iv) human resource management. Figure 5 indicates into which quadrant each attribute falls for each Center.

Partnership is fundamental to the structure of the CGIAR network and the way it conducts business. Stakeholder perceptions suggest that this element requires strategic attention. Further, given the increasing importance of transparency in stakeholder relations in all sectors, and the ongoing need to demonstrate value for investment, the CGIAR has opportunities to improve its reputation among stakeholders. The influence mapping activity within the survey reveals that civil society organizations are among the most influential entities in determining the CGIAR's reputation.

TABLE 2

Diversity Measures in the CGIAR Performance Measurement System in 2006

CENTER	% OF MANAGEMENT POSITIONS OCCUPIED BY WOMEN	MOST PREVALENT NATIONALITY	% OF IRS OF THE MOST PREVALENT NATIONALITY
Africa Rice	27	Japan	12
Bioversity	22	United Kingdom	13
CIAT	50	USA	16
CIFOR	14	USA	20
CIMMYT	18	USA	11
CIP	43	Peru	17
ICARDA	0	Syria	13
ICRISAT	8	India	31
IFPRI	31	USA	30
IITA	22	Nigeria	20
ILRI	40	United Kingdom	17
IRRI	7	USA	14
IWMI	50	India	19
W. Agroforestry	50	USA	18
WorldFish	33	Australia	19

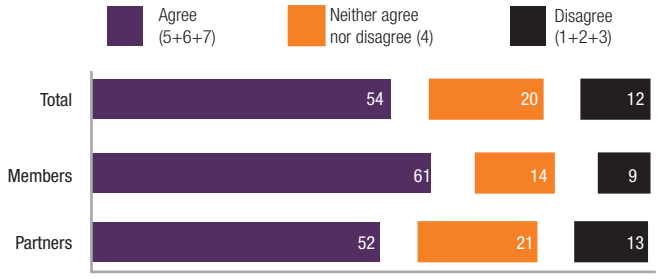
[1] Short-term solvency (liquidity) is defined as current assets plus long-term investment minus current liabilities divided by per-day operating expenses excluding depreciation. Long-term financial stability is defined as unrestricted net assets less net fixed assets divided by per-day operating expenses. Efficiency of operations is defined as indirect costs divided by direct costs and expressed as a percentage. Cash management on restricted operations is defined as restricted accounts receivable divided by restricted accounts payable.

TABLE 3 Financial Health

	Liquidity[1] target: 90-120 days	Adequacy of reserves target: 75-90 days	Indirect cost ratio	Cash management on restricted operations[2]
Africa Rice	102	102	28	2.03
Bioversity Int'l	104	67	18	0.61
CIAT	36	18	20	0.35
CIFOR	193	150	21	0.62
CIMMYT	94	80	25	0.38
CIP	96	89	13	0.13
ICARDA	167	118	16	0.46
ICRISAT	171	114	23	0.27
IFPRI	96	81	15	0.53
IITA	159	159	20	0.22
ILRI	194	159	22	0.34
IRRI	388	388	21	0.52
IWMI	100	64	21	0.31
World Agroforestry	140	82	22	1.10
WorldFish	204	194	21	0.45
CGIAR Average	**149**	**124**	**20**	**0.46**

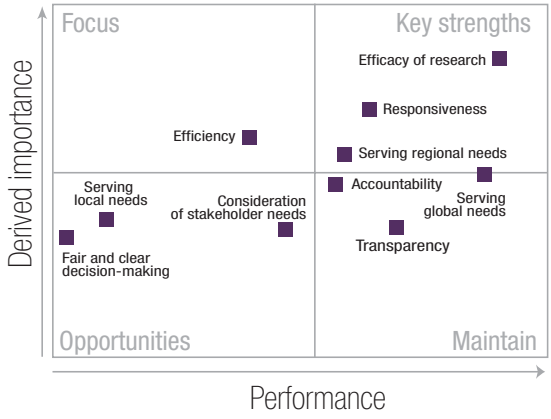
[1] 2004 and 2005 restated to exclude investment in nonmarketable government of India bonds held by ICRISAT.
[2] 2004 and 2005 restated to reflect refinement of formula (accounts receivables stated net of allowance for doubtful accounts).

FIGURE 3 "The CGIAR does an excellent job advancing sustainable agriculture through research"[1]



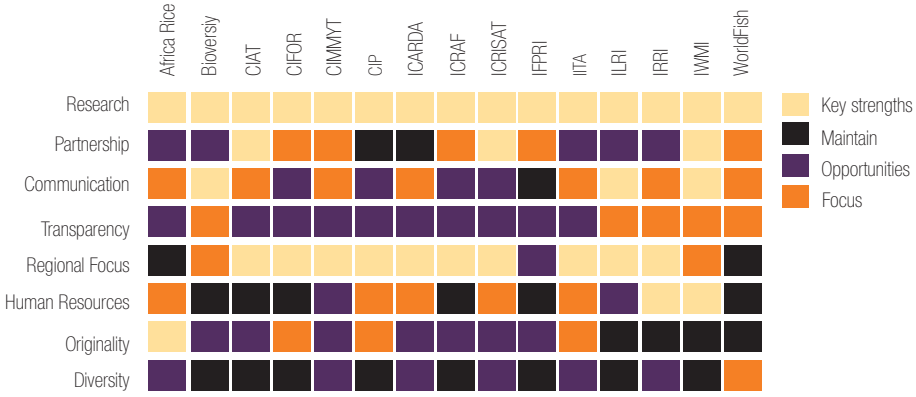
[1] Respondents were asked to rate the accuracy of the statement from 1 (least) to 7 (most); white space indicates "don't know" or "not applicable."
Source: The CGIAR's 2006 Stakeholder Perception Survey, GlobeScan Inc.

FIGURE 4 Drivers of the Perceived Performance of CGIAR in Advancing Sustainable Agriculture



Source: The CGIAR's 2006 Stakeholder Perception Survey, GlobeScan Inc.

FIGURE 5 Summary of Quadrant Analysis



Source: The CGIAR's 2006 Stakeholder Perception Survey, GlobeScan Inc.

Executive Council: Guiding and Facilitating

The Executive Council (ExCo) of the CGIAR endorsed strengthening the CGIAR's engagement of civil society and, more broadly, helped steer the System's reform program.

CGIAR System Priorities: ExCo monitored the implementation of the CGIAR-approved System Priorities by establishing an ad hoc committee on funding them. Following ExCo's recommendation to reopen the Challenge Program process, a call for new Challenge Program concept notes was issued in late 2006. The Sub-Saharan Africa Challenge Program was approved for a 3-year post-inception phase.

Monitoring and Evaluation: ExCo made recommendations stemming from external program and management reviews of the Center for International Forestry Research, International Center for Agricultural Research in the Dry Areas, World Agroforestry Centre and WorldFish Center, which were endorsed by the CGIAR. It reviewed the CGIAR Performance Measurement System results for 2005 including a stakeholders' perception survey. ExCo's recommendations on the results of the stripe review on corporate governance of CGIAR Centers were approved, and the CGIAR has asked the Centers to report back to ExCo on the implementation of the recommendations.

Programmatic and Structural/Organizational Alignment: ExCo continues to monitor and facilitate programmatic and organizational alignment in sub-Saharan Africa and beyond. Building on recommendations made by two task forces on alignment needs and options, ExCo made recommendations, later approved by the CGIAR, on alignment activities, including that work proceed at a faster pace.

Finance and Governance: ExCo reviewed financial results for 2005 and program and budget plans for 2007, receiving CGIAR approval of its recommendations. ExCo continues to monitor financial risk at Centers and for the whole System and has asked the CGIAR Secretariat to work with Centers on benchmarks for financial reserves and liquidity requirements.

ExCo recommended, and the CGIAR approved, reducing the number of CGIAR Center seats on ExCo from two to one, to reflect the formation of the Alliance of CGIAR Centers and the Centers' decision to speak with a collective, unified voice.

Reflecting Members' appreciation of ExCo contributions in 2006, over 80% of them agreed or strongly agreed that "decision-making by the CGIAR at AGM06 was facilitated by ExCo's guidance and recommendations."

ExCo is a 20-member subsidiary group of the CGIAR that incorporates perspectives from all System components. ExCo's main functions include (i) acting on behalf of the CGIAR between annual general meetings (AGMs) on matters delegated to it; (ii) facilitating CGIAR decision making by reviewing issues and submitting recommendations; (iii) providing oversight as CGIAR decisions are implemented; (iv) reviewing, extending or curtailing the terms of the CGIAR committees; and (v) considering how the CGIAR can improve its dialogue with civil society and the private sector.

ExCo meets twice annually and conducts business year round with support from the CGIAR Secretariat and, as needed, from ad hoc committees, study groups and task forces it establishes. ExCo makes recommendations and reports to the CGIAR at AGMs and through e-mail updates.

Contributions in 2006 address engaging civil society, as well as guiding and overseeing System priorities and numerous activities including alignment

System Office:
Fostering Internal and External Partnerships

While finding better ways for components of the System to operate efficiently and effectively, the System Office also reaches out to stakeholders

The System Office the CGIAR consists of the main central service units of the CGIAR System, whose activities it integrates. It continuously strives to foster partnerships within the System and with external partners, while further improving its ways of serving the CGIAR System as a whole.

The past year saw the launch of a number of partnership initiatives, all aiming to advance the way the System does business and to strengthen collaboration. The full 2006 System Office Annual Report can be found at www.cgiar.org/soar/2006/index.html.

The following are key areas in which the System Office helps to facilitate the establishment of new partnerships and new ways of working:

Expanded CSO-CGIAR partnerships. The CGIAR held its first-ever Civil Society-CGIAR Forum at its Annual General Meeting 2006, which was hosted by the World Bank in Washington, DC. Attended by more than 100 civil society organization (CSO) representatives, the event featured a series of lively group discussions aiming to identify lessons learned and new avenues for improved collaboration, drawing on the experience of nearly 50 current CSO-CGIAR partnerships. These partnerships were showcased in a 3-day Innovation Marketplace. The System Office, particularly the CGIAR Secretariat, Science Council Secretariat, and Information and Communication Technologies and Knowledge Management (ICT-KM) Program, worked closely together to make this stakeholder meeting a success. In the lead-up to the forum, an online discussion — the CSO-CGIAR virtual conversation — took place, facilitated by knowledge-sharing staff from the ICT-KM Program. Its main purpose was to let prospective participants get to know one another better and learn about a wide range of collaborative experiences, and so enhance CSO-CGIAR engagement.

At the end of the Civil Society-CGIAR Forum, a new CSO-CGIAR Competitive Grants Program was launched to

- support innovative projects involving civil society partners and other stakeholders in agricultural research for development,
- promote partnerships between the CGIAR and CSOs that apply novel approaches for working together better, and
- create new avenues by which a growing network of CSO and CGIAR partners can continue to learn from one another through active knowledge sharing.

In addition, the Science Council has launched a study on CSO-CGIAR Center partnership to identify and disseminate the lessons learned. Implementation of the study is coordinated by the Science Council Secretariat.

Communication and media relations. High-level briefings in Belgium, China, France and Netherlands organized by the CGIAR Secretariat received strong communications support, with the aim of fostering dialogue among key decision makers and opinion leaders.

The newly established Media Unit has begun to build effective working relations with national

System Office Units

Alliance Office of the CGIAR Centers
Central Advisory Service – Intellectual Property
CGIAR Secretariat
Chief Information Office
Gender and Diversity Program
Internal Auditing Unit
Media Unit
Science Council Secretariat
Strategic Advisory Service for Human Resources

and international journalists, and with such media organizations as the International Federation of Environmental Journalists and the World Federation of Science Journalists, contributing to a considerable expansion in media coverage of the work of the CGIAR Centers.

Strengthened collective action. The Centers have formed the Alliance of the CGIAR Centers to enable them to contribute more effectively and efficiently to the mission of the CGIAR. The Alliance Principles and Procedures were formally ratified in 2006. This was a watershed for the Alliance, as its decisions are binding for all 15 members. The Alliance Office worked to backstop, facilitate and coordinate the work of the Alliance, including that of the Alliance Executive and the Alliance Board.

Intellectual property management. The Central Advisory Service – Intellectual Property has worked to develop capacities in intellectual property management within Centers. It also aims to expand the community of practice through engagement with partners outside the CGIAR, such as Public Interest Intellectual Property Associates, Public Intellectual Property Resource for Agriculture, St. Edmund's College of the University of Cambridge, Michigan State University, Haryana State University and Kerala State University, among others, to cooperatively advance the management of intellectual property and technology-transfer to foster the production of research products as global public goods.

Partnerships for women in agricultural science. The Gender and Diversity Program works closely with Centers and Members to promote the development of women leaders in agricultural science through a fellowship program for enhancing the careers of women crop scientists in Africa. In addition, the program has organized mentoring and leadership training for some 50 women scientists from eight African countries.

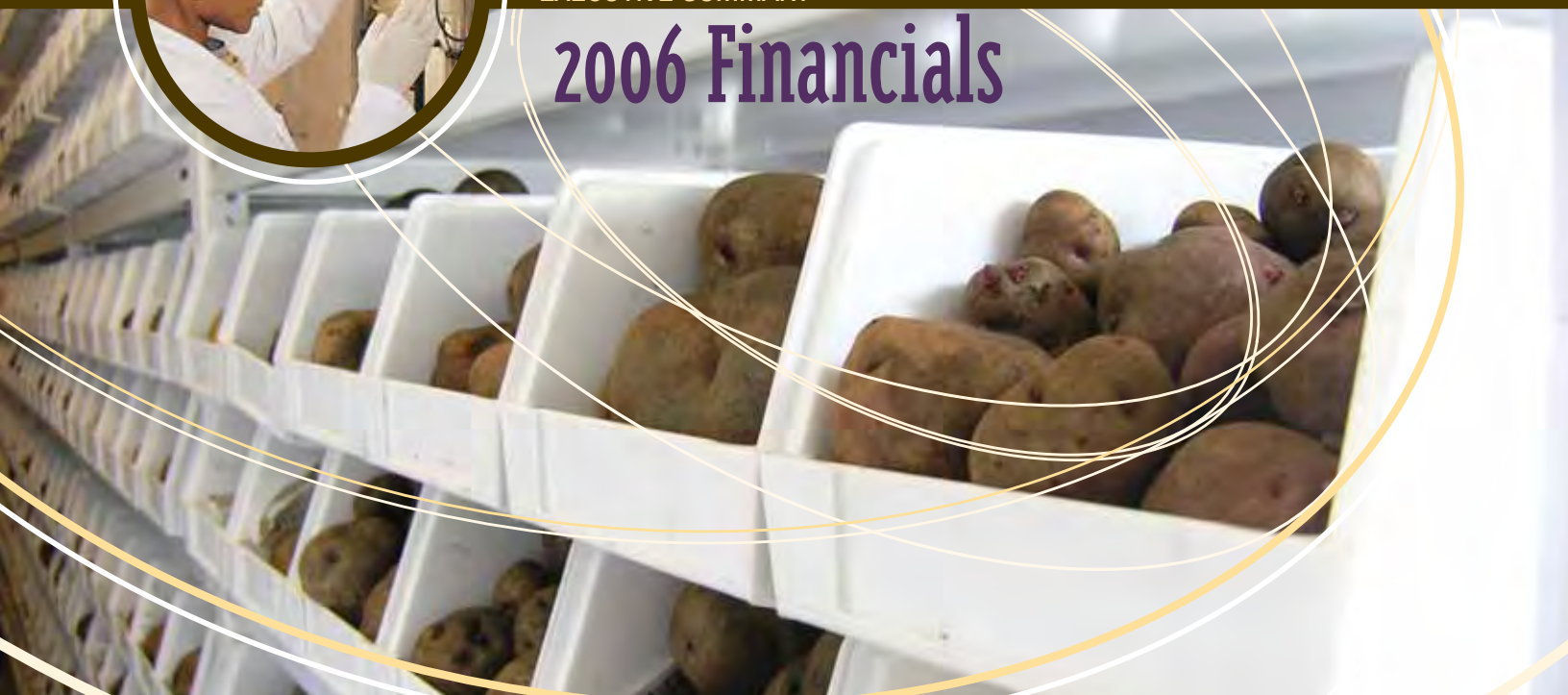
A culture for innovation and change. The Strategic Advisory Service for Human Resources has been helping Centers to further build and expand their organizational culture for innovation and change, aiming at a value-driven organization with staff collaborating in teams to achieve goals with honest, open communication. It thereby promotes a working environment of trust, fairness and integrity, where people learn and strive for excellence.

Monitoring, evaluation and stakeholder perceptions. Centers undergo external program and management reviews regularly. In addition, all Centers report annually on their performance in terms of research results and institutional and financial health. A comprehensive stakeholder-perceptions survey of partners is conducted every 3 years (see page 45). The survey in 2006 provides strategic guidance on how to strengthen partnerships and collaboration with stakeholder organizations. In addition, the 17 Systemwide and Ecoregional Programs of the CGIAR underwent external review in 2006, providing a better understanding of the strengths and weaknesses of research across different Center mandates. These monitoring and evaluation exercises are managed jointly by the Science Council and CGIAR secretariats, with other parts of the System Office, such as the Internal Auditing Unit, playing a crucial role in verifying data.

Efficiency through collaborative effort. Through concentrated efforts by the office of the Chief Information Officer and collaborative efforts with Centers, considerable financial savings were achieved across participating Centers. These savings, which amounted to more than US$500,000 (double last year's savings), are allocated for Systemwide or collective purchases of applications and software previously either purchased by Centers at high cost or done without. By collective cooperation and purchasing, Centers not only saved considerable funds but were also able to provide to staff tools that were previously unavailable but much needed.

EXECUTIVE SUMMARY

2006 Financials



A Collaborative Effort of IRRI and the CGIAR Secretariat

The 2006 financial results reported here are based on the audited financial statements of the 15 Centers and four Challenge Programs supported by the CGIAR. The aggregation, analyses and reports, including this summary, were produced through a joint effort of a team from the International Rice Research Institute (IRRI) consisting of Kwame Akuffo-Akoto, Melba M. Aquino and Rodelita D. Panergalin, and the CGIAR Secretariat.

Executive Summary of the 2006 CGIAR Financial Results

Members of the CGIAR support the CGIAR Centers and programs of their choice. The 2006 financial outcome[1] discussed here is an aggregation of the audited financial statements of the 15 Centers and the four Challenge Programs supported by the CGIAR.

Overview

Total revenues (funding and Center earned income) decreased by $12 million or approximately 3% from $460 million in 2005 to $448 million. Of the total revenues available in 2006, $426 million represented contributions from Members and non-members, a decrease of $24 million (5%) compared with 2005, and $22 million from Center earned income. In addition, expenditure in 2006 increased by $6 million (1%) over 2005. The result was an excess of expenditure over revenues of $10 million, which was financed by reserves.

The decrease in funding was mainly due to the non-delivery of the 2006 European Commission (EC) funding of approximately $30 million because extended negotiations with the World Bank could not be completed in 2006.[2] The loss of these funds affected the operating results and financial indicators of individual Centers and the System as a whole. If this funding had been delivered, the aggregate net result would have been a surplus of $20 million. The loss was partly offset by reprogramming $6 million of the World Bank's contribution and by an increase of $8 million from non-members.

The results above affected the financial indicators of liquidity and reserves for the System as a whole. Reserves decreased by $10 million or 13 days of operations. The liquidity indicator also dropped, from 155 days to 149 days. These two indicators were down because expenditure increased while revenues decreased in 2006.

Background

The review and aggregation of the financial statements was done in accordance with fiduciary management and reporting standards approved by the CGIAR to guide the Centers. Additional information on financial compliance is contained in box 1.

Overall Financial Outcome

A summary of the CGIAR program outcome for 2006 and a comparison with the approved and the actual outcome for 2005 is shown in table A (here and in other tables, some columns and rows may not sum precisely because of rounding). Highlights of the System's 2006 financial performance are shown in table 1 with comparative information for the previous 4 years.

Contributions to Centers and Programs

In 2006, aggregate contributions to the System decreased by $24 million (5%), with contributions to Centers and programs totaling $426 million, compared with $450 million in 2005. Unrestricted contributions decreased by $14 million (7%) from $195 million. Restricted contributions decreased by $10 million (4%). Table 2 is a schedule of CGIAR contributions from 1972 to 2006.

[1] The outcome is reported in US dollars.
[2] Through the new thematic program for food security to be launched in 2007, the EC will address the 2006 shortfall in favor of the CGIAR Centers. In this respect, a contribution agreement with the International Fund for Agricultural Development, totaling €45 million, is being negotiated. Signature of the agreement is foreseen by the autumn of 2007.

As shown in figure 1, the decrease in 2006 contributions came from two groups: Europe by $28 million and North America by $3 million. The significant decrease in funding from European Members was due mainly to non-delivery of the 2006 EC contribution. On the other hand, contributions from non-members increased by $8 million, partly thanks to the increase from the Bill & Melinda Gates Foundation.

European Members make their contributions in their national currencies, which Centers then translate into US dollars. In 2006, these currencies were generally strong in relation to the US dollar, and the net impact on the 2006 contributions was an additional $4.5 million compared with a reduction of $2.4 million in 2005.

Contributions from 15 Members accounted for approximately 73% of funding for the research agenda in 2006. The United States, contributing $60.7 million, was again the single largest contributor, followed by the World Bank with $50 million and the United Kingdom with $44 million. The top Member contributions in 2005 and 2006 are shown in table B.

Figure 2 illustrates the distribution of funding by Center and compares it with expenditure.

Resource Allocation

Total CGIAR expenditure in 2006 increased by 1% to $458 million. The following paragraphs summarize, at the System level, resource allocation by object of expenditure and by region.

Box 1. Compliance with Financial Guidelines

To ensure transparency and consistency in financial practices and the presentation of financial information, the 15 CGIAR-supported Centers are required to follow financial guidelines issued by the CGIAR Secretariat. Developed with the input of Center finance personnel and external financial experts, these guidelines aim to bring the CGIAR's financial practices into conformity with the best international standards.

As part of the annual review of substantive financial performance, and in keeping with practice established in 2004, a peer group of CGIAR Centers finance directors, the CGIAR internal audit director and a finance expert from the World Bank have reviewed the 2006 externally audited financial statements of the Centers to assess their compliance with CGIAR accounting policies and reporting guidelines, as well as to validate the analysis underpinning the CGIAR financial report. The peer review also made a number of recommendations to promote best practice in fiduciary management and financial reporting. In 2006, the Financial Management Guideline was the latest standard in the series to be updated to meet international best practice.

Expenditure by Object: The share of the costs of personnel increased marginally with a corresponding decrease in the share of the cost of collaboration and partnerships, as shown in figure 3.

Expenditure by Region: Illustrative allocations by region using the 2006 financing plan ratios appear in figure 4, which indicates no major shifts between 2005 and 2006, and confirms the priority focus on sub-Saharan Africa.

TABLE A

Summary of 2006 CGIAR Approved Program vs Actual Outcome

(millions of US dollars)

		Actual 2006 Outcome	2006 Plan Approved at AGM05	Actual 2005 Outcome
Expenditure				
Centers[1]		418	430	417
Challenge Programs	Centers	29	24	25
	Partners	11	35	10
Total expenditure		**458**	**489**	**452**
Revenue				
Funding				
Centers[2]		386	398	415
Challenge Programs	Centers	29	24	25
	Partners	11	30	10
Subtotal funding		**426**	**452**	**450**
Earned income		22	17	10
Total revenue		**448**	**469**	**460**
(Financed from reserves)/Carried forward for future use		**(10)**	**(20)**	**8**

[1] Includes System Office and CGIAR committees.
[2] Includes System Office, CGIAR committees and unallocated Member funds.

FIGURE 1

CGIAR Funding

(millions of US dollars)

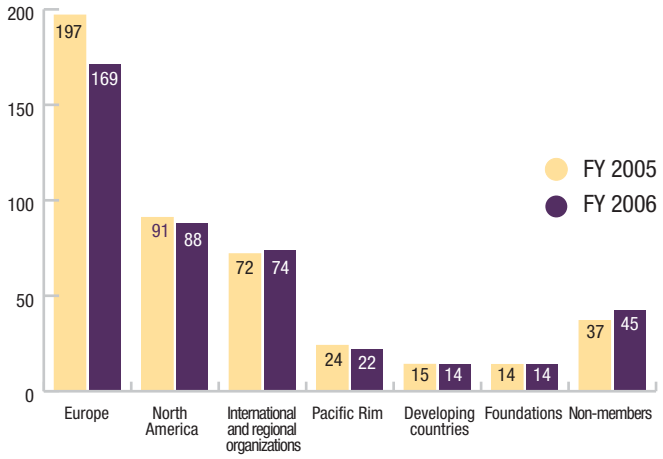


TABLE B

Top Member Contributions

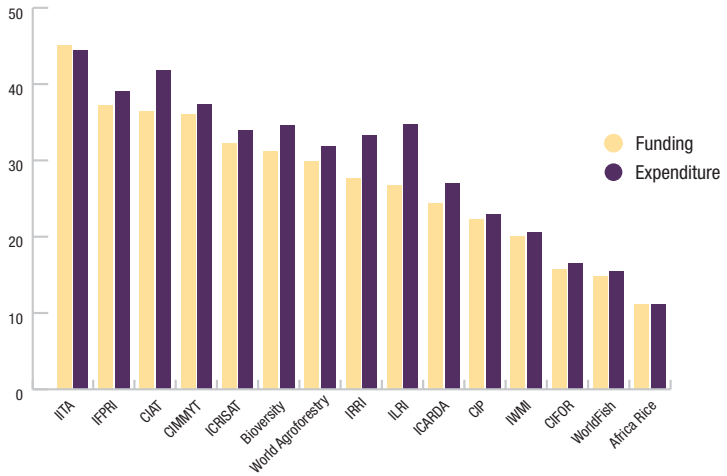
(millions of US dollars)

	2005		2006
Industrialized Countries and Multilateral Organizations			
United States of America	54.8	United States of America	60.7
World Bank	50.0	World Bank	50.0
United Kingdom	44.2	United Kingdom	44.1
Canada	36.4	Canada	26.9
European Commission	30.6	Netherlands	20.1
Developing Countries			
Nigeria	3.2	India	4.1
India	1.8	Nigeria	2.5
Brazil	1.3	Mexico	1.1
China	1.2	Turkey	1.0
Turkey	1.1	Kenya	0.9

FIGURE 2

Funding and Expenditure by Center, 2006

(millions of US dollars)



Center Perspectives

The funding decrease noted at the System level is the aggregate of a range of outcomes at individual Centers. Total contributions increased for four Centers compared with eight in 2005: ICRISAT and WorldFish saw funding increase by 10-15%, and IITA and CIP experienced increases of less than 10%. Four Centers (Bioversity, ICARDA, ILRI and IWMI) had decreases of 10-20%. The other seven Centers recorded decreases of less than 10%.

Operating results (contributions plus Center earned income, less expenditure) showed that five Centers (Africa Rice, CIMMYT, CIP, ICRISAT and IITA) ended the year with a surplus, or half of the 10 such Centers in 2005. As a percentage of total revenues, these five Centers had surpluses below 5%. Ten Centers incurred deficits. CIFOR, ICARDA, IFPRI, IWMI, World Agroforestry and WorldFish had deficits of below 5%, while Bioversity, CIAT, ILRI and IRRI had deficits of 5-20%.

Table 3 provides the results of operations by Center and for the System as a whole, including results for that portion of Challenge Programs implemented by CGIAR partners for 2006, and compares these with 2005. Table 4 provides an overview of the System's finances (expenditure allocation and financing). Table 5 summarizes the System's overall financial position for the years 2002 to 2006.

Summary of Challenge Programs

Funding for Challenge Programs decreased by $4.8 million in 2006. The biggest decrease was to the Generation Challenge Programme due mainly to the non-delivery of EC funding. During the year, $33.6 million was available for Challenge Programs, compared with $38.4 million in 2005. Expenditure of $40 million, compared with $35 million in 2005, resulted in a reduction of $6 million from cumulative balance of the Challenge Program fund. Table 6 summarizes Challenge Program revenue and expenditure.

2006 Progress Report on Action Plans requested by ExCo

Following the review of 2005 financial indicators, the Executive Council asked seven Centers to submit action plans to address deficiencies in liquidity and reserves indicators.

Three Centers (Africa Rice, CIAT and CIMMYT) had been cited for low liquidity relative to the CGIAR recommended benchmark of 90-120 days of operating expenditure. Three Centers (CIAT, CIMMYT and IWMI) had been cited for low reserves relative to the CGIAR recommended benchmark of 75-90 days of operating expenditure. On the liquidity indicator, CIMMYT and IWMI

FIGURE 3

Expenditure by Object

(millions of US dollars)

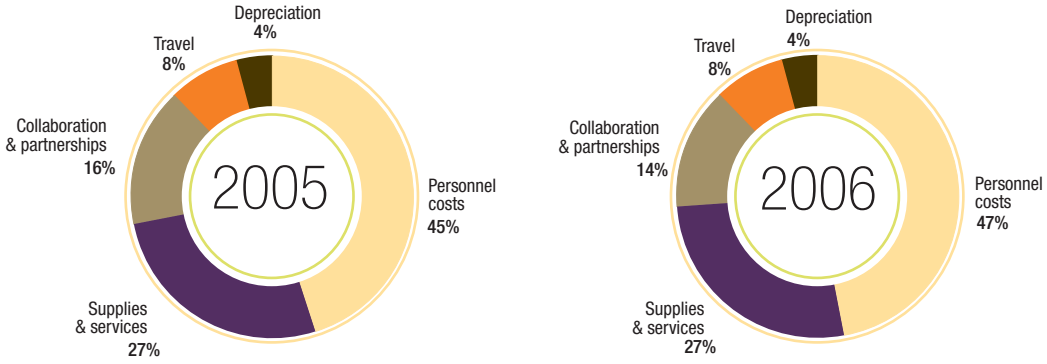
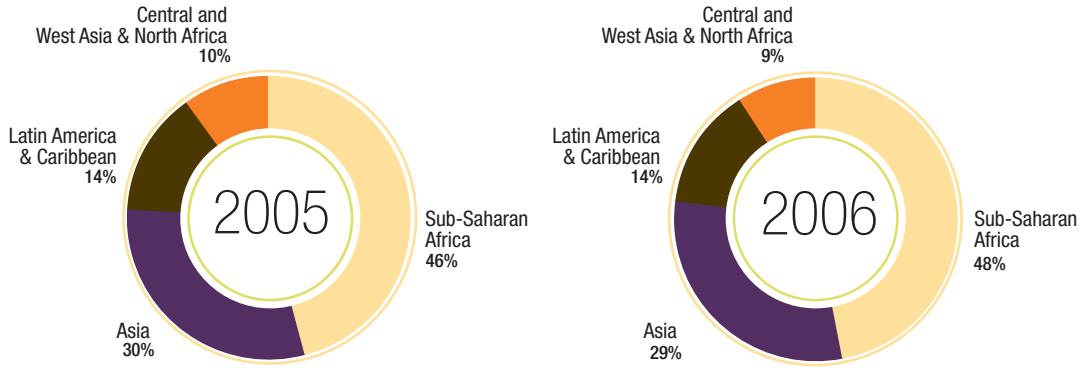


FIGURE 4

Expenditure by Region

(millions of US dollars)



improved to the CGIAR benchmark, while CIAT showed further decline. With respect to the reserves indicator, only CIMMYT showed improvement, while CIAT and IWMI showed deterioration.

The three Centers cited for very high reserves in 2005 (IRRI, WorldFish and ILRI) drew down their reserves in 2006.

Conclusion

The 2006 results indicate the need for continued vigilance regarding the financial health at both the Center and System level. In three cases (Bioversity, CIAT and IWMI), reserves are below the minimum benchmark. For Bioversity, this result was specifically related to the EC funding situation.

The Centers face a difficult combination of continuing decline in unrestricted funding and only limited success in achieving full cost recovery on restricted projects. Centers must carefully assess their financial strategies, including those for resource mobilization, project cost recovery and reserves management.

Actual	2002	2003	2004	2005	2006
Revenues (millions of US dollars)					
Agenda funding	357	381	437	450	426
(of which unrestricted)	44%	44%	45%	43%	42%
Earned income	14	17	16	10	22
Total	**371**	**398**	**453**	**460**	**448**
Agenda funding (millions of US dollars)					
Members					
Europe	147	161	181	197	169
North America	65	76	87	91	88
Pacific Rim	26	24	26	24	22
Developing countries	12	12	17	15	14
Foundations	13	12	13	14	14
International and regional organizations	69	70	73	72	74
Subtotal	**332**	**356**	**397**	**413**	**381**
Non-members	25	25	40	37	45
Total	**357**	**381**	**437**	**450**	**426**
Top three contributors					
	USA World Bank United Kingdom	USA World Bank EC	USA World Bank United Kingdom	USA World Bank United Kingdom	USA World Bank United Kingdom
Staffing (number)					
Internationally recruited	1,060	1,065	1,063	1,100	1,115
Support	6,699	6,837	6,728	6,774	7,039
Total	**7,759**	**7,902**	**7,791**	**7,874**	**8,154**
Object of expenditure					
Personnel costs	49%	46%	45%	45%	47%
Supplies & services	40%	31%	29%	27%	27%
Collaboration & partnerships		12%	14%	16%	14%
Travel	7%	7%	8%	8%	8%
Depreciation	4%	4%	4%	4%	4%
Total (millions of US dollars)	**381**	**395**	**425**	**452**	**458**
Expenditure by region					
Sub-Saharan Africa	43%	45%	47%	46%	48%
Asia	33%	32%	32%	30%	29%
Latin America & the Caribbean	15%	14%	13%	14%	14%
Central and West Asia & North Africa	9%	9%	9%	10%	9%
Results of operations [surplus/(deficit) in US$m]	**(10)**	**3**	**28**	**8**	**(10)**
Center financial information (millions of US dollars)					
Unrestricted net assets excluding fixed assets	96	127	156	158	145
Liquidity indicators					
Working capital (days expenditure)[1]	125	151	164	155	149
Current ratio	1.8	1.8	1.9	1.9	1.8
Adequacy of reserve indicator					
Net assets excl. fixed assets expenditure in days	96	124	145	137	124
Fixed asset indicators					
Capital expenditure (millions of US dollars)	9.3	9.7	15.5	15.8	16.8
Capital expenditure / depreciation	65%	63%	90%	101%	107%
Efficiency of operations indicator					
Indirect cost ratio			24%	21%	20%
Cash management on restricted operations					
Restricted accounts receivable ratio[2]			0.55	0.80	0.46

[1] 2004 and 2005 restated to exclude investment in nonmarketable government of India bonds held by ICRISAT.
[2] 2004 and 2005 restated to reflect refinement of formula (accounts receivables stated net of allowance for doubtful accounts).

TABLE 2

CGIAR Funding to the Research Agenda by Member Group

(millions of US dollars)

Members	1972-2001	2002	2003	2004	2005	2006	Total
Europe							
Austria	23.4	0.2	0.8	1.7	2.1	2.1	30.4
Belgium	88.0	4.9	6.4	7.1	5.1	7.4	118.9
Denmark	144.1	10.2	9.1	8.2	7.4	6.7	185.7
European Commission	279.3	24.5	27.2	26.3	30.6	6.6	394.5
Finland	36.1	1.5	1.7	1.9	2.0	2.1	45.2
France	78.7	7.8	7.6	6.3	5.0	7.1	112.4
Germany	290.7	10.5	11.6	15.3	15.4	15.3	358.7
Ireland	12.1	2.1	2.6	3.4	5.0	5.0	30.1
Israel				0.1	0.4	0.5	0.9
Italy	105.6	4.1	4.4	7.2	7.5	4.8	133.8
Luxembourg	5.5	0.8	0.7	0.6	0.6	0.5	8.7
Netherlands	189.5	17.0	19.2	20.9	24.1	20.1	290.9
Norway	113.4	10.4	11.2	11.7	12.6	13.4	172.7
Portugal	1.8	0.3	0.01				2.1
Spain	15.6	1.3	2.3	2.3	1.9	2.1	25.5
Sweden	150.8	10.7	13.6	14.6	14.3	14.4	218.4
Switzerland	248.3	16.0	15.6	18.1	18.2	16.7	333.0
United Kingdom	245.4	24.8	26.4	35.3	44.2	44.1	420.2
Subtotal	**2,028.3**	**146.9**	**160.5**	**181.0**	**196.5**	**168.9**	**2,882.0**
North America							
Canada	308.7	10.7	20.9	32.5	36.4	26.9	436.1
United States of America	998.2	54.9	55.5	54.2	54.8	60.7	1,278.3
Subtotal	**1,306.9**	**65.6**	**76.4**	**86.7**	**91.2**	**87.6**	**1,714.4**
Pacific Rim							
Australia	118.2	7.3	7.3	8.8	10.6	10.1	162.3
Japan	526.8	17.1	15.0	14.4	10.9	9.1	593.3
Korea, Republic of	7.4	1.1	1.2	1.5	1.8	1.8	14.9
New Zealand	2.3	0.7	0.8	1.2	0.8	1.0	6.7
Subtotal	**654.7**	**26.2**	**24.4**	**25.9**	**24.0**	**22.1**	**777.1**
Developing countries							
Bangladesh	1.0				0.2		1.2
Brazil	4.2	0.9	0.3	0.2	1.3		6.8
China	9.1	1.0	1.0	1.0	1.2	0.8	14.0
Colombia	17.1	2.5	2.3	1.9	0.6	0.4	24.8
Cote d'Ivoire	0.9	0.02					0.9
Egypt, Arab Republic of	7.6	0.8	0.5	0.6	0.5	0.5	10.5
India	13.4	1.0	1.3	1.4	1.8	4.1	23.0
Indonesia	2.7	0.2	0.2	0.2	0.1	0.1	3.3
Iran, Islamic Republic of	15.6	0.9	1.2	1.0	0.7	0.4	19.7
Kenya	1.3	0.2	0.3	0.6	0.4	0.9	3.7
Malaysia				0.03	0.1	0.1	0.2
Mexico	10.1	0.9	0.7	1.6	0.7	1.1	15.2
Morocco			0.5	0.5	0.5	0.5	2.0
Nigeria	15.1		1.5	4.6	3.2	2.5	26.9
Pakistan	1.5		0.1	0.2	0.4	0.2	2.4
Peru	1.5	0.9	0.4	0.6	0.4	0.3	4.2
Philippines	7.1	0.2	0.2	0.4	0.3	0.4	8.6
Russian Federation	0.2						0.2
Saudi Arabia	5.0						5.0
South Africa	2.7	0.8	0.8	0.8	1.0	0.5	6.6
Syrian Arab Republic	1.0	0.6	0.5	0.5	0.5	0.6	3.6
Thailand	1.1	0.1	0.1	0.2	0.1	0.1	1.6
Turkey				0.04	1.1	1.0	2.2
Uganda	0.6	0.6	0.6	0.3	0.2	0.1	2.4
Subtotal	**118.8**	**11.6**	**12.4**	**16.6**	**15.3**	**14.6**	**189.3**
Foundations							
Ford Foundation	59.6	1.3	0.8	0.9	0.9	1.0	64.6
IDRC	36.5	2.4	1.9	2.9	3.2	3.9	50.8
Kellogg Foundation	4.2	0.3	0.3	0.4	0.4	0.4	5.9
Rockefeller Foundation	60.6	7.5	7.8	8.5	8.7	8.4	101.4
Syngenta Foundation		1.4	1.1	0.8	0.8	0.5	4.6
Subtotal	**160.9**	**13.0**	**11.9**	**13.3**	**14.0**	**14.2**	**227.3**
International and regional organizations							
ADB	29.4	6.5	6.0	5.0	4.1	3.7	54.6
AfDB	17.2	0.6	0.2	0.4	0.2	1.1	19.5
Arab Fund	17.2	1.0	0.8	1.2	1.2	1.2	22.6
FAO	1.7	1.8	2.0	1.5	1.4	1.7	10.0
Gulf Cooperation Council				0.1	0.1	0.3	0.6
IDB	170.6	0.5	0.3	0.3	0.2	0.4	172.2
IFAD	68.5	5.8	5.7	6.2	7.5	8.3	102.0
OPEC Fund	14.7	0.2	0.3	0.5	0.4	0.5	16.6
UNDP	156.1	1.5	1.1	1.1	0.9	0.5	161.1
UNEP	4.9	1.3	3.6	6.6	6.1	6.5	29.0
World Bank[1]	795.8	50.0	50.0	50.0	50.0	50.0	1,045.9
Subtotal	**1,276.1**	**69.3**	**69.9**	**72.7**	**72.1**	**74.1**	**1,634.2**
Total Members	5,546	332	356	396	413	381	7,424
Non-members	89.7	24.8	25.4	40.4	36.8	44.8	261.8
Total	**5,635**	**357**	**381**	**437**	**450**	**426**	**7,686**

[1] Before 2002 excluded CGIAR Secretariat costs.

TABLE 3

Results of Operations by Center

(millions of US dollars)

	2005					2006				
Center	Agenda funding	Earned income	Total revenue	Expenditure	Result	Agenda funding	Earned income	Total revenue	Expenditure	Result
Africa Rice	11.6	0.2	11.7	10.9	0.8	11.1	0.4	11.5	11.2	0.3
Bioversity	35.6	(0.4)	35.2	34.6	0.6	31.2	0.9	32.2	34.6	(2.5)
CIAT	40.3	1.2	41.5	42.4	(0.9)	36.5	1.4	37.9	41.8	(3.9)
CIFOR	16.7	0.5	17.2	17.5	(0.3)	15.7	0.5	16.2	16.5	(0.3)
CIMMYT	39.3	1.5	40.8	38.8	2.0	36.0	1.8	37.8	37.4	0.4
CIP	21.8	0.3	22.0	22.0	0.0	22.3	0.6	23.0	22.9	0.1
ICARDA	28.7	0.9	29.6	29.1	0.5	24.4	1.6	26.0	27.0	(1.0)
ICRISAT	28.4	1.1	29.5	28.4	1.1	32.3	2.9	35.3	34.0	1.2
IFPRI	38.2	0.3	38.5	39.7	(1.2)	37.2	0.9	38.1	39.1	(1.0)
IITA	41.2	1.5	42.8	40.2	2.6	45.1	1.4	46.5	44.4	2.1
ILRI	31.7	2.5	34.3	32.2	2.1	26.7	3.9	30.6	34.8	(4.2)
IRRI	28.5	(0.4)	28.1	33.4	(5.3)	27.7	3.9	31.6	33.3	(1.7)
IWMI	23.1	0.5	23.6	23.1	0.5	20.0	0.5	20.5	20.6	(0.1)
World Agroforestry	30.2	0.3	30.5	30.0	0.5	29.9	1.2	31.1	31.9	(0.9)
WorldFish	13.3	0.1	13.5	15.2	(1.7)	14.8	0.4	15.2	15.5	(0.3)
Subtotal	**428.5**	**10.3**	**438.7**	**437.5**	**1.2**	**410.9**	**22.4**	**433.3**	**445.0**	**(11.7)**
System level										
System Office and committees	9.7		9.7	9.9		9.3		9.3	9.3	
Advance	3.9		3.9		3.9	(1.9)		(1.9)	(1.9)	
Unallocated Member funding	3.0[1]		3.0[1]		3.0[1]	0.7[2]		0.7[2]		0.7[2]
Additional Challenge Program funds						1.5		1.5		1.5
Subtotal	**16.6**		**16.6**	**9.9**	**6.9**	**9.6**		**9.6**	**7.4**	**2.2**
Less inter-center activities[3]	(5.4)		(5.4)	(5.4)		(5.6)		(5.6)	(5.6)	
Subtotal System level	**11.2**		**11.2**	**4.5**	**6.9**	**4.0**		**4.0**	**1.8**	**2.2**
Total	**439.6**	**10.3**	**449.9**	**442.0**	**8.1**	**414.9**	**22.4**	**437.3**	**446.9**	**(9.5)**
Plus Challenge Program partners[4]	10.2		10.2	10.2		11.3		11.3	11.3	
Total CGIAR Program	**450**	**10**	**460**	**452**	**8**	**426**	**22**	**448**	**458**	**(10)**

[1] From Italy, Brazil and Morroco.
[2] From Mexico and Morroco.
[3] Inter-Center activities netted out at the System, not Center, level to maintain the integrity of Center accounts.
[4] Challenge Program components implemented by CGIAR partners.

(millions of US dollars)

	Expenditure allocation						Financing										
							Member funding									Reserves	
Center	Personnel	Supplies & services	Collaboration & partnerships	Travel	Depreciation	Total	Europe	North America	Pacific Rim	Developing countries	Founda-tions	Intl & regnl organizations	Non-members	Inter-center activities	Total funding	Earned income	Addition (+)/ Draw(-)
Africa Rice	5.2	3.8	0.6	0.6	0.9	11.2	4.0	2.2	1.7	0.1	0.4	2.5	0.3		11.1	0.4	0.3
Bioversity	18.8	8.2	5.4	1.8	0.5	34.6	17.4	2.5	1.7	0.6	0.8	6.1	2.1		31.2	0.9	(2.5)
CIAT	21.9	10.5	4.4	3.6	1.4	41.8	12.8	9.1	1.1	0.6	3.1	4.7	4.7	0.5	36.5	1.4	(3.9)
CIFOR	8.1	2.2	4.8	1.0	0.4	16.5	9.6	1.5	0.7	0.1	0.7	2.0	1.2		15.7	0.5	(0.3)
CIMMYT	16.6	12.1	5.6	2.0	1.0	37.4	10.2	8.9	5.0	1.7	2.1	5.5	2.4	0.1	36.0	1.8	0.4
CIP	10.6	6.0	3.7	1.8	0.9	22.9	9.8	5.2	0.5	0.3	0.6	3.1	2.2	0.6	22.3	0.6	0.1
ICARDA	11.3	8.4	2.8	2.8	1.6	27.0	8.2	4.3	1.4	1.6	0.2	6.8	1.0	0.8	24.4	1.6	(1.0)
ICRISAT	15.9	10.6	4.0	2.8	0.7	34.0	10.9	6.3	1.1	2.4	0.7	7.1	3.6	0.3	32.3	2.9	1.2
IFPRI	17.6	8.4	9.4	3.0	0.7	39.1	11.6	10.4	0.9	1.0	1.1	5.2	5.5	1.5	37.2	0.9	(1.0)
IITA	18.0	15.7	6.4	3.1	1.3	44.4	14.3	15.6	0.4	3.0	0.6	3.6	7.2	0.4	45.1	1.4	2.1
ILRI	16.9	10.9	2.2	2.2	2.6	34.8	12.3	5.9	0.4	0.5	0.5	3.1	3.3	0.7	26.7	3.9	(4.2)
IRRI	14.4	10.4	3.8	2.7	2.0	33.3	10.6	5.0	4.3	0.9	0.7	5.1	1.1		27.7	3.9	(1.7)
IWMI	12.5	1.3	2.8	3.6	0.5	20.6	11.6	1.8	0.8	0.7	0.3	3.4	1.2	0.1	20.0	0.5	(0.1)
World Agroforestry	13.9	9.9	3.4	3.9	0.9	31.9	11.7	6.0	0.6	0.2	1.5	3.8	5.7	0.4	29.9	1.2	(0.9)
WorldFish	7.7	3.3	2.6	1.6	0.3	15.5	7.0	2.0	1.4	0.5		3.3	0.7		14.8	0.4	(0.3)
Subtotal	**209.4**	**121.6**	**61.8**	**36.5**	**15.7**	**445.0**	**161.9**	**86.9**	**21.9**	**14.0**	**13.3**	**65.2**	**42.0**	**5.6**	**410.9**	**22.4**	**(11.7)**
System level																	
System Office and Committees						9.3						9.3			9.3		
Advance						(1.9)						(1.9)			(1.9)		
Unallocated Member funding[1]										0.7					0.7		0.7
Additional Challenge Program funds												1.5			1.5		1.5
Subtotal						**7.4**				**0.7**		**8.9**			**9.6**		**2.2**
Less inter-center activities						(5.6)									(5.6)		
Subtotal System level						**1.8**				**0.7**		**8.9**			**4.0**		**2.2**
Total	**209.4**	**121.6**	**61.8**	**36.5**	**15.7**	**446.9**	**161.9**	**86.9**	**21.9**	**14.7**	**13.3**	**74.1**	**42.0**	**5.6**	**414.9**	**22.4**	**(9.5)**
Plus Challenge Program partners[2]	5.3	3.1	1.6	0.9	0.4	11.3	7.0	0.7			0.8		2.8		11.3		
Total CGIAR Program	**215**	**125**	**63**	**37**	**16**	**458**	**169**	**88**	**22**	**15**	**14**	**74**	**45**	**6**	**426**	**22**	**(10)**

[1] From Mexico and Morroco.
[2] Challenge Program components implemented by CGIAR partners.

TABLE 5

CGIAR System Financial Position

(thousands of US dollars)

	2002	2003	2004	2005	2006
Assets					
Current assets					
Cash and cash equivalents	149,076	201,662	237,047	221,853	255,899
Accounts receivable					
Members	72,864	87,768	69,717	83,907	56,363
Employees	3,078	2,797	3,594	4,105	4,726
Others	14,864	14,527	17,147	22,280	20,952
Inventories	4,447	4,165	4,540	4,593	6,001
Pre-paid expenses	3,673	3,262	2,994	3,401	3,140
Other current assets	3,327	4,567	16,924	6,580	943
Total current assets	**251,329**	**318,748**	**351,963**	**346,719**	**348,024**
Noncurrent assets					
Net property, plant and equipment	77,172	79,585	78,433	77,869	78,277
Investments	41,828	37,838	34,985	46,642	41,020
Others assets			3,012	1,223	7,076
Total noncurrent assets	**119,000**	**117,423**	**116,430**	**125,734**	**126,373**
Total assets	**370,329**	**436,172**	**468,393**	**472,453**	**474,397**
Liabilities and net assets					
Current liabilities					
Accounts payable					
Members	78,749	110,925	115,904	119,497	112,065
Employees	11,877	13,805	12,435	14,514	19,024
Others	34,177	47,181	49,216	44,430	49,254
Accruals and provisions	42,377	28,925	24,294	24,086	25,938
Total current liabilities	**167,180**	**200,836**	**201,849**	**202,527**	**206,281**
Long-term liabilities	**27,906**	**25,876**	**30,486**	**31,897**	**42,383**
Total liabilities	**195,086**	**226,712**	**232,335**	**234,424**	**248,664**
Net assets					
Unrestricted					
Unrestricted net assets excl fixed assets	96,039	126,820	155,539	157,967	145,088
Fixed assets	77,172	79,585	78,433	77,869	78,277
Unrestricted net assets	**173,211**	**206,405**	**233,972**	**235,835**	**223,365**
Restricted	**2,032**	**3,054**	**2,086**	**2,194**	**2,368**
Total net assets	**175,243**	**209,459**	**236,058**	**238,029**	**225,733**
Total liabilities and net assets	**370,329**	**436,172**	**468,393**	**472,453**	**474,397**

TABLE 6

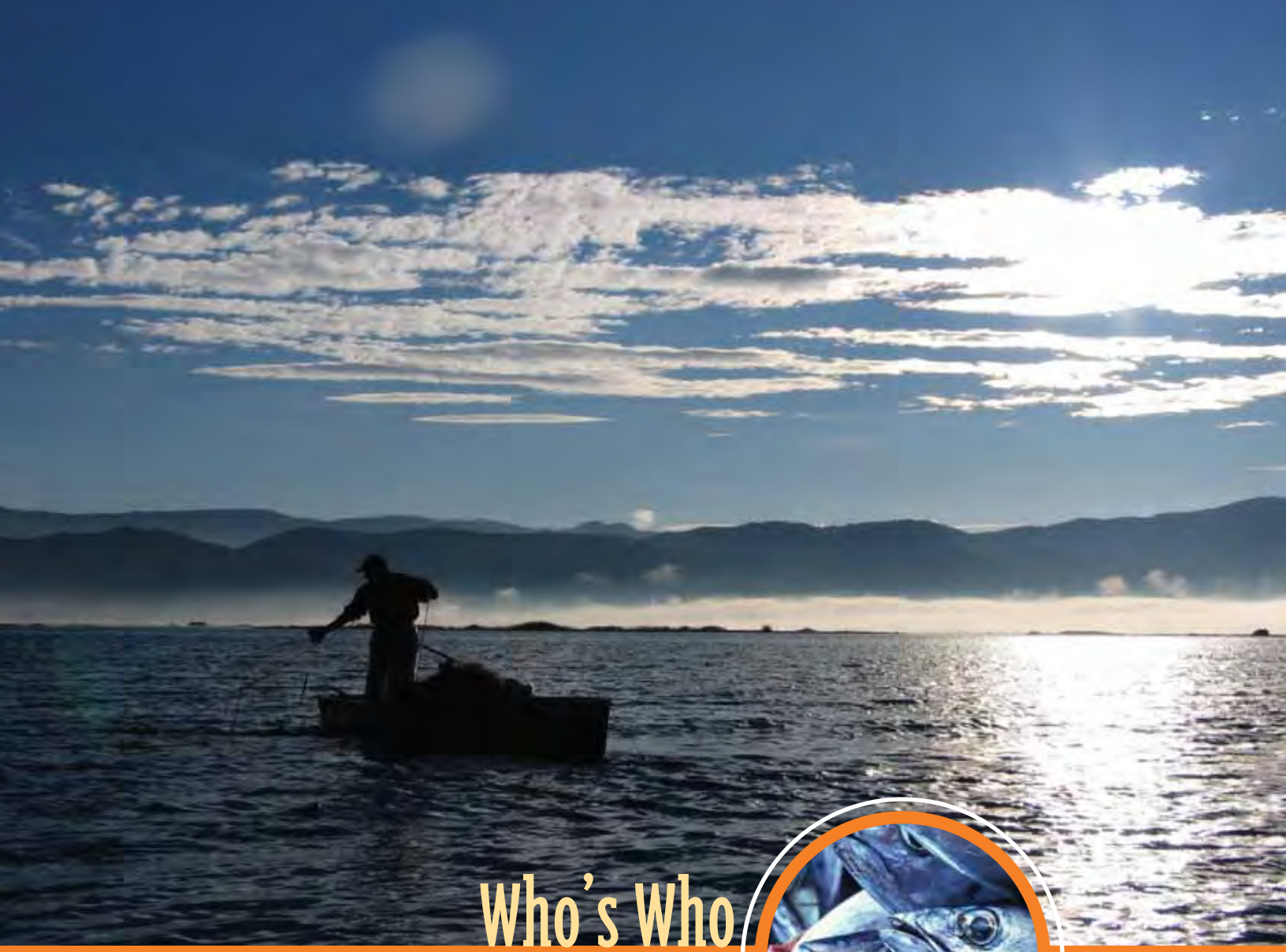
Summary of Challenge Programs, 2006

(millions of US dollars)

Funds Available	HarvestPlus	Water & Food	Generation	SSA	Total
Bill & Melinda Gates Foundation	7.0				7.0
Denmark	0.3			0.4	0.7
European Commission				0.9	0.9
France		2.1			2.1
Italy				0.6	0.6
Netherlands				1.2	1.2
Pioneer			0.02		0.02
Rockefeller Foundation			1.0		1.0
Sweden	0.1		0.1		0.2
Switzerland		1.5	0.4		1.9
United Kingdom	1.0	2.0	4.7	0.1	7.8
USA	1.8				1.8
Waternet		0.05			0.05
World Bank	2.0	2.7	3.3	0.2	8.2
Total	**12.1**	**8.4**	**9.5**	**3.5**	**33.6**

Expenditure	HarvestPlus		Water & Food		Generation		SSA		Total	
	Center	Others	Center	Others	Center	Others	Center	Others	Center	Others
Bioversity	0.2				1.0		0.02		1.2	
CIAT	1.4		1.1		1.1		0.2		3.8	
CIMMYT	1.0		0.4		3.3				4.7	
CIP	0.6		0.1		1.1				1.8	
ICARDA	0.2		0.5		0.4				1.0	
ICRISAT	0.3		0.9		0.6				1.8	
IFPRI	2.7		0.2						3.0	
IITA	0.7				0.7		1.2		2.7	
IRRI	0.6		2.5		1.6				4.7	
IWMI			2.8						2.8	
World Agroforestry			0.04						0.04	
WorldFish			0.9						0.9	
Subtotal	**7.7**	**4.0**	**9.6**	**0.9**	**9.7**	**4.9**	**1.5**	**1.5**	**28.4**	**11.3**
Total		**11.6**		**10.5**		**14.6**		**3.0**		**39.7**
2006 balance		**0.5**		**(2.1)**		**(5.0)**		**0.4**		**(6.3)**
2005 cumulative balance		**10.6**		**4.2**		**14.2**		**2.5**		**31.5**
Cumulative balance		**11.1**		**2.1**		**9.2**		**2.9**		**25.2**

Who's Who



Indonesia
Iran, Islamic Republic
Ireland
Israel
Italy
Japan
Kenya
Korea, Republic of
Luxembourg
Malaysia
Mexico
Morocco
Netherlands
New Zealand
Nigeria
Norway
Pakistan
Peru
Philippines
Portugal
Romania
Russian Federation
South Africa
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Sweden
Switzerland
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Thailand
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Katherine Sierra, Vice President, Sustainable Development Network, World Bank

CGIAR Director
Francisco J.B. Reifschneider

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United Nations Development Programme, Philip Dobie
World Bank, Eija Pehu

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OECD/DAC
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Erwin Lopez, Internal Auditor

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Strategic Advisory Service on Human Resources
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Peter Ninnes, CIMMYT

THE CGIAR 1971–2006

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Ian Johnson, 2000-2006
Ismail Serageldin, 1994-2000
V. Rajagopalan, 1991-1993
Wilfried Thalwitz, 1990-1991
W. David Hopper, 1987-1990
S. Shahid Hussain, 1984-1987
Warren Baum, 1974-1983
Richard H. Demuth, 1971-1974

CGIAR Director, 2001-
Francisco J.B. Reifschneider, 2001-

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Curtis Farrar, 1982-1989
Michael Lejeune, 1975-1982
Harold Graves, 1972-1975

Science Council Chair, 2004-
Per Pinstrup-Andersen, 2004-

Science Council Executive Director, 2004-
Ruben Echeverria, 2004-

interim Science Council Chair, 2001-2003
Emil Javier, 2001-2003

Technical Advisory Committee Chairs, 1971-2001
Emil Q. Javier, 2000-2001
Donald Winkelmann, 1994-1999
Alex McCalla, 1988-1994
Guy Camus, 1982-1987
Ralph Cummings, 1977-1982
Sir John Crawford, 1971-1976

Technical Advisory Committee Executive Secretaries, 1971-2003
Shellemiah Keya, 1996-2003
Guido Gryseels, 1995-1996
John Monyo, 1985-1994
Alexander von der Osten, 1982-1985
Philippe Mahler, 1976-1982
Peter Oram, 1971-1976

Facts About the CGIAR

- The CGIAR is a strategic partnership dedicated to mobilizing agricultural science to reduce poverty, promote agricultural growth and protect the environment. It supports 15 international research Centers conducting groundbreaking work to nourish the future.
- Among the 64 CGIAR Members, 25 are industrialized countries, 22 are developing countries, 12 are international and regional organizations, and 5 are private foundations.
- Thirteen of the 15 CGIAR Centers are located in developing countries.
- CGIAR financial resources increased from US$337 million in 2001 to $426 million in 2006, and membership increased from 58 to 64 in the same period.
- The CGIAR alliance employs over 8,500 scientists and technical staff in over 100 countries. The countries contributing the most CGIAR research staff are Australia, Colombia, France, India, Japan, Nigeria, Peru, Syria, United States and United Kingdom.
- By 2006, the CGIAR had trained over 75,000 developing country scientists and researchers.
- Regarding CGIAR Center board membership, all 15 Centers balanced the number of members from the South and the North in 2006. Of the 188 board members, 59% came from developing countries, and 34% were women.
- Of the 15 directors leading CGIAR Centers in 2006, four were from developing countries and two were women. Women occupy 28% of CGIAR managerial positions.
- CGIAR Centers have 185 regional offices and work in over 100 countries.

Acronyms and Abbreviations

AB	Alliance Board (board chairs of Centers supported by the CGIAR)
AE	Alliance Executive (directors general of Centers supported by the CGIAR)
AGM	Annual General Meeting of the CGIAR
AIDS	acquired immunodeficiency syndrome
ARC	Agricultural Research Center (Egypt)
CBN	Cassava Biotechnology Network
CGIAR	Consultative Group on International Agricultural Research
CIAT	Centro Internacional de Agricultura Tropical International (International Center for Tropical Agriculture), Colombia
CIFOR	Center for International Forestry Research, Indonesia
CIMMYT	Centro Internacional de Mejoramiento de Maiz y Trigo (International Maize and Wheat Improvement Center), Mexico
CIP	Centro Internacional de la Papa (International Potato Center), Peru
CPWF	Challenge Program on Water and Food of the CGIAR
CSO	civil society organization
CWANA	Central and West Asia and North Africa
DAC	Development Assistance Committee of OECD
DANIDA	Danish International Development Agency
DRC	Democratic Republic of Congo
DREB	dehydration response element binding protein
Embrapa	Empresa Brasileira de Pesquisa Agropecuária (Brazilian Agricultural Research Corporation)
ExCo	Executive Council of the CGIAR
FAO	Food and Agriculture Organization of the United Nations
FLAR	Fondo Latinamericano para Arroz de Riego (Latin American Fund for Irrigated Rice)
FORAGRO	Fondo Regional de Tecnología Agropecuaria
GCP	Generation Challenge Programme of the CGIAR
GDP	gross domestic product
GHI	Global Hunger Index
GRPC	Genetic Resources Policy Committee of the CGIAR
HIV/AIDS	human immunodeficiency virus/acquired immunodeficiency syndrome
HKI	Helen Keller International, USA
IAR4D	integrated agricultural research for development
IARC	international agricultural research center
IBAMA	Instituto Brasileiro do Meio Ambiente e Dos Recursos Naturais Renováveis (Brazilian Institute of Environment and Renewable Natural Resources)
ICAR	Indian Council of Agricultural Research
ICARDA	International Center for Agricultural Research in the Dry Areas, Syria
ICRAF	World Agroforestry Centre, Kenya
ICRISAT	International Crops Research Institute for the Semi-Arid Tropics, India
ICT-KM	information and communication technologies and knowledge management
IDRC	International Development Research Centre
IFAD	International Fund for Agricultural Development
IFPRI	International Food Policy Research Institute, United States
IITA	International Institute of Tropical Agriculture, Nigeria
ILRI	International Livestock Research Institute, Kenya and Ethiopia
INEAC	Institut national d'etudes agronomiques du Congo, Democratic Republic of Congo
INERA	Institut national pour l'etude et la recherche agronomique (National Institute for Agronomic Study and Research), Democratic Republic of Congo
INIA	National Institute for Agronomic Research, Mozambique

INIAP	Instituto Nacional Autónomo de Investigaciones Agropecuarias (National Institute of Agricultural and Livestock Research), Ecuador
INRA	Institut national de la recherche agronomique (National Agricultural Research Institute), Morocco
IPGRI	International Plant Genetic Resources Institute (now renamed Bioversity International), Italy
IRS	internationally recruited staff
IRRI	International Rice Research Institute, Philippines
IWMI	International Water Management Institute, Sri Lanka
JIRCAS	Japan International Research Center for Agricultural Sciences, Japan
LCDP	Limpopo Community Development Program, South Africa
LI-BIRD	Local Initiatives for Biodiversity, Research and Development, Nepal
LIMPAST	Limpopo Agricultural Strategic Team, South Africa
MDG	millennium development goal
NARS	national agricultural research system(s)
NGO	nongovernmental organization
NTFP	non-timber forest product
OECD	Organization for Economic Cooperation and Development
OFSP	orange-fleshed sweetpotato
OPEC	Organization of Petroleum Exporting Countries
R&D	research and development
RUAF	Resource Centers on Urban Agriculture and Food Security
SARRNET	Southern Africa Root Crops Research Network, Mozambique
SGRP	Systemwide Genetic Resources Program of the CGIAR
SIDA	Swedish International Development Cooperation Agency
SPIA	Standing Panel on Impact Assessment of the CGIAR
SPME	Standing Panel on Monitoring and Evaluation of the Science Council of the CGIAR
SPMS	Standing Panel on Mobilizing Science of the CGIAR
SPPS	Standing Panel on Priorities and Strategies of the CGIAR
SSA-CP	Sub-Saharan Africa Challenge Program of the CGIAR
SSNM	site-specific nutrient management
STCP	Sustainable Tree Crops Program
TIGR	The Institute of Genomic Research, USA
UK	United Kingdom
UPA	urban and peri-urban agriculture
US, USA	United States of America
WARDA	Africa Rice Center (formerly West Africa Rice Development Association), Benin
WUE	water-use efficiency

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