

Consultative Group on International Agricultural Research

**Annual General Meeting
Stakeholder Meeting/Science Forum
December 6-7, 2005
Marrakech, Morocco**

**Summary Record
of
Proceedings**



*CGIAR Secretariat
(A CGIAR System Office Unit)
The World Bank
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Abbreviations and Acronyms Used

AARINENA	Association of Agricultural Research Institutions in the Near East and North Africa
APAARI	Asia-Pacific Association of Agricultural Research Institutions
CACAARI	Central Asia and Caucasus Association of Agricultural Research Institutions
CBC	Committee of Board Chairs
CDC	Center Directors Committee
CGIAR	Consultative Group on International Agricultural Research
CP	Challenge Program
DG	Director General
DFID	Department for International Development (UK)
ExCo	CGIAR Executive Council
FAO	Food and Agriculture Organization of the United Nations
FARA	Forum for Agricultural Research in Africa
GFAR	Global Forum for Agricultural Research
MDG	Millennium Development Goal
MTP	Medium Term Plan
NARS	National Agricultural Research Systems
OECD	Organization for Economic Cooperation and Development
PSC	CGIAR Private Sector Committee
SC	CGIAR Science Council
SO	System Office
SPs	System Priorities
SROs	Sub-Regional Organizations
SSA	Sub-Saharan Africa

International Agricultural Research Centers Supported by the CGIAR

Centro Internacional de Agricultura Tropical (CIAT)

Center for International Forestry Research (CIFOR)

Centro Internacional de Mejoramiento de Maiz y Trigo (CIMMYT)

Centro Internacional de la Papa (CIP)

International Center for Agricultural Research in the Dry Areas (ICARDA)

International Crops Research Institute for the Semi-Arid Tropics (ICRISAT)

International Food Policy Research Institute (IFPRI)

International Institute of Tropical Agriculture (IITA)

International Livestock Research Institute (ILRI)

International Plant Genetic Resources Institute (IPGRI)

International Rice Research Institute (IRRI)

International Water Management Institute (IWMI)

The Africa Rice Center (WARDA)

World Agroforestry Centre (ICRAF)

WorldFish Center (WorldFish)

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CGIAR AGM 2005—Stakeholder Meeting

Timed Agenda

Monday, December 5, 2005

Opening Ceremony for the AGM

16:30 – 17:10

Official Opening of AGM'05

- (a) Welcome remarks: Ian Johnson, CGIAR Chairman
- (b) Opening remarks: H.E Driss Jettou, Prime Minister of Morocco
- (c) Moroccan Science for Development: Hamid Narjisse, Director General, INRA

17:10– 18:10

Inauguration of Exhibition and Viewing, Prime Minister of Morocco, Ministers, CGIAR Chairman, Dignitaries and Participants

19:00 – 22:00

Official Moroccan Welcome Dinner

Tuesday, December 6, 2005

Stakeholder Meeting (Science Forum)

09:00 – 11:00

Agenda Item 1. Opening Session of AGM05

Session Co-Chairs: Ian Johnson, CGIAR Chairman and H.E. Dr. Lhafi Abdeladim, High Commissioner for Forest and Desertification (Morocco)

- (a) Chairman's Opening Remarks
- (b) State of the CGIAR – *Francisco Reifschneider, CGIAR Director*
- (c) Overview of the World Food Situation – *Joachim von Braun, Director General, IFPRI*

Agenda Item 2. A Conversation with Ministers

Session Co-Chairs: Ian Johnson, CGIAR Chairman and Njabulo Nduli (South Africa)

Participants: H.E. Prof. Mouhattane Mohamed, State Secretary of Rural Development (Morocco), H.E. Venancio Massingue, Min. of S &T, (Mozambique), H.E. Adel Safar, Minister of Agriculture (Syria), and H.E. Habib Sy, Min. of Agriculture and Hydrology (Senegal)

11:00 – 11:30

Coffee Break

11:30 – 13:00

Agenda Item 3. Global Science and CGIAR Priorities

Session Co-Chairs: H.E. Venancio Massingue (Mozambique) and H.E. Habib Sy (Senegal)

- (a) Science for Agricultural Development 2005 –*Lisa Sennerby-Forsse, Member, Science Council*
- (b) CGIAR System Priorities – Per Pinstrup-Andersen, *Chair, Science Council*
- (c) Discussion

13:00 – 14:30

Lunch Break and Luncheon Meetings (See Schedule of Events)

14:30 – 16:30

Agenda Item 4. CGIAR Priorities: Science for the Poor

Parallel Sessions (*Separate program is issued for each session*)

- (a) Sustaining biodiversity: *Conservation of indigenous livestock*
- (b) Genetic improvement: *Genetic enhancement of selected species*
- (c) Agricultural diversification and high-value commodities and products: *Increasing income through fruit and vegetable production*
- (d) Sustainable management of water, land and forest resources: *Integrated land, water, and forest management at landscape level*
- (e) Improving policies and facilitating institutional innovation: *Improving policies, institutions, and technologies to support sustainable poverty reduction*

16:30 – 17:00

Coffee Break

17:00 – 18:30

Agenda Item 5. Strengthening Research-for-Development Capacities

Parallel Sessions (*Separate program is issued for each session*)

- (a) Farmers as research and technology transfer partners
- (b) Local, regional and global science capacity
- (c) Embedding research in a system of innovation
- (d) Evaluation of CGIAR training
- (e) Scientific capacity and economic growth

19:00

2005 Sir John Crawford Memorial Lecture

“The Dimensions of Science and Technology for Development: Perspectives from the Maghreb” - Dr. Zohra Ben Lakhdar, Professor of Physics, University of Tunis and Winner of the 2005 L’Oréal-UNESCO Women in Science Award
(Reception will follow after the Lecture)

Wednesday, December 7, 2005

08:30 – 10:30

Agenda Item 6. Summary of Key Messages from Parallel Sessions (Agenda Item 4 “CGIAR Priorities: Science for the Poor,” and Agenda Item 5 “Strengthening Research-for-Development Capacities”)

Session Co-Chair: H.E. Habib Sy (Senegal) and H.E. Adel Safar (Syria)

Report on key messages from Parallel Sessions – *Per Pinstруп-Andersen*
Chair, Science Council

Agenda Item 7. Strengthening Partnerships for Agricultural Development

Session Co-Chair: H.E. Habib Sy (Senegal) and H.E. Adel Safar (Syria)

- (a) Perspective from Central and West Asia and North Africa (CWANA)
 - i. Challenges and opportunities – *Adel El-Beltagy*
Director General, ICARDA
 - ii. Views of CWANA NARS:
 - Abdel Naby Fardous- President, Association of Agricultural Research Institutions in the Near East and North Africa (AARINENA)*
 - Abdushukur Khanazarov – President, Central Asia and Caucasus Association of Agricultural Research Institutions (CACAARI)*
- (b) Perspective from the Global Forum on Agricultural Research – *Mohammad Roozitalab, Chair, GFAR*
- (c) Perspective from the CGIAR Private Sector Committee – *Usha Barwale-Zehr, PSC*
- (d) Discussion

10:30 – 11:00

Coffee Break

11:00 – 12:00

Agenda Item 8. 2005 CGIAR Awards

Agenda Item 9. Science in Action

- (a) Video on INRA and CGIAR Work in the region
- (b) Closing remarks by CGIAR Chairman

12:00

Visit to INRA and Lunch Break

The CGIAR Business Meeting will commence at 14:30 sharp in the Palais de Congrès. Attendance is by invitation only.

CGIAR AGM 2005—Stakeholder Meeting (Science Forum)

Agenda Item 1: Opening Session

The plenary session of the Stakeholder Meeting (Science Forum) opened on Tuesday, December 6, 2005 at the Palais des Congres, Marrakech, Morocco with approximately 1000 participants attending. CGIAR Chair Ian Johnson and H. E. Dr. Lhafi Abdeladim, High Commissioner for Forests and Desertification, Morocco served as co-chairs.

Dr. Abdeladim, welcoming participants to the stakeholders meeting, said Morocco considered the AGM05 a privileged moment. The Government and people of Morocco were delighted to greet all those who were attending the AGM in whatever capacity and looked forward to an exchange and pooling of ideas that would benefit people in the region and beyond.

He noted that throughout the world there was an increasing emphasis on food security. Agriculture was the basis of food security and agricultural research was the foundation on which modern agriculture has been built.

A new element was added to agricultural research and agricultural practice after UNCED (UN Conference on the Environment and Development, Rio de Janeiro, January, 1992) combined anti-poverty, anti-hunger, and environmental imperatives in the concept of sustainable development. Morocco's quest for sustainable development is particularly affected by the three Ds – dryness, drought, and desertification. Morocco's experience has convinced policy makers and researchers that ecosystems need to be rebalanced through the sustainable management of rural space.

The purpose of sustainable development, he said, is to ensure that human development can be achieved even in difficult natural circumstances. Morocco therefore takes a holistic approach, with the poor at the heart of development policies.

In formulating national policies, Morocco was very much alive to the global nature of the challenges confronting the attainment of sustainable development. These challenges could be successfully overcome by the sharing of knowledge and common action. He welcomed the efforts of the CGIAR to promote both knowledge sharing and creative partnerships with the potential for widespread impact.

(a) CGIAR Chair's Opening Statement

CGIAR Chairman Ian Johnson delivered an opening statement on the subject "Where Agriculture Began: Gateway to the Future." In introductory comments, Johnson noted that the 2005 CGIAR Annual General Meeting was its first in the Central, West Asia, and North Africa region, or CWANA. The CGIAR was honored that it was held under the high patronage of His Majesty King Mohamed VI.

Johnson referred to the "natural fit" between the CGIAR and the CWANA region where agriculture had its beginnings. Over 40 percent of the CWANA population live in rural areas, and depend on agriculture for their livelihood. In Morocco itself, some 17 percent of GDP is derived from agriculture. Morocco supports innovation and scientific research, he said, in order to cope with many challenges including those associated with globalization. Morocco has created effective research partnerships including several with CGIAR-supported Centers. More recently, Morocco, as a CGIAR Member, is helping the CGIAR "to strengthen what we do and how we do it."

Johnson pointed out that discussions at AGM05 would take place against an international consensus that has placed agriculture back on the map of development. The CGIAR is proud to have worked with others in both South and North to make this happen.

Reminding the meeting that despite phenomenal progress in the world much more remains to be done, he reviewed major issues that required constant attention. These include water scarcity, biodiversity loss, soil degradation, overexploitation of marine fisheries, and instability of livestock populations. In addition, he outlined a number of current issues that were of global concern, such as avian influenza; the threat to wheat supplies from the emergence of a new virulent race of stem rust, Ug99; the need to accelerate the search for renewable sources of energy including the use of biofuels; global climate change; the deprivation faced by developing countries that need access to markets; and the debilitating effect of livestock diseases.

He said that all the issues he had dealt with – such as global communicable diseases; global environmental threats; global trade barriers -- highlighted the need for the CGIAR System and its stakeholders to see agriculture in its widest context; a local, regional, and global context; a public health context; a food policy context; an economic and wealth creating context; and an ecological context.

He also suggested that the CGIAR might consider the need to develop the capacity for a rapid response to debilitating problems as they arise so that they might be prevented from developing into major crises, while respecting the CGIAR mandate to produce international public goods. He also suggested that the CGIAR should consider six specific actions that will further enhance its effectiveness as a catalyst of research-based development:

- additional measures to modernize governance in the CGIAR and its Centers;
- continually sharpening the focus on the core task of research for development;
- programmatic and structural alignment throughout the CGIAR, beginning with Sub-Saharan Africa;
- building on the progress made in fostering partnerships with the private sector and civil society;
- continuing to strengthen and increase funding;
- moving communications into even higher levels.

Concluding on a personal note, Johnson joined his predecessors in affirming that chairmanship of the CGIAR was his best experience at the World Bank. He pointed out that for the first time in the history of the CGIAR, The Charter provides for inclusive consultation, involving the entire Membership, on the next steps. Full consultation in accordance with The Charter will help to guarantee a seamless and effective succession. (For the full text of the opening statement, please see http://www.cgiar.org/pdf/agm05/agm05_ij_openingspeech.pdf.)

IN MEMORIAM

The CGIAR Chair paid tribute to four colleagues who died this past year. In honoring them, he said, the CGIAR honored all colleagues whom they had lost.

Robert Carksy, an agronomist working at the African Rice Center (WARDA), and before that at IITA, died under tragic circumstances. In his death, Africa lost a pioneering scientist whose work will have a lasting impact on the lives of thousands of African farmers. The CGIAR Secretariat has dedicated its latest publication, “Scientists in the CGIAR,” edited by Rebecca Carsky, to his memory.

Robert Havener's association with international agricultural research spanned some 50 years. He was a wise and helpful colleague, and certainly a mentor to many in the CGIAR. His influence was spread wide. One of his collaborators described him as a scientist who could look back at what he had done in his career and truly know that he had a profound and positive impact on humankind.

Ravi Tadvalkar left an indelible stamp on financial management in the CGIAR. He will be remembered for the innovations he introduced, for his constant emphasis on transparency and accountability at all levels, and for his commitment to nurture the talents of others.

John Vercoe was respected as a distinguished scientist. He chaired the ILRI Board, was Chair of the Committee of Board Chairs, and served on ExCo. As a colleague and leader, he was known for his deep sense of caring, as well as his commitment to agriculture, and he was admired for his sparkling sense of humor.

A moment of silence was observed.

(b) **State of the CGIAR**

CGIAR Director Francisco Reifschneider, delivering his annual briefing on the “State of the CGIAR”, emphasized the good news that agriculture has been restored to its rightful place on the development agenda.

Two clear demonstrations of this fact are the endorsement of agriculture and agricultural research by the world’s family of nations meeting at the UN, and the gradual reversal of the diminishing trend of Official Development Assistance (ODA) for agriculture.

The UN Secretary General in a special report (“In Larger Freedom”) published earlier this year, called for a special focus on (in alphabetical order) agricultural research, biodiversity, climate change, desertification, equitable trading systems, increasing food output and income, natural resource management, rural development....” This approach was endorsed at the UN World Summit in September 2005.

As for funding, ODA for agriculture which was halved from US\$6.2 billion in 1980 to US\$3.0 billion in 1995, and dropped to US\$2.3 billion in 2002, has begun climbing back. The amount of ODA for agriculture increased to US\$2.9 billion in 2003, and this trend is expected to continue.

Within the CGIAR, Reifschneider said, both Membership and investment had grown. In 1995, with 51 Members, CGIAR investments stood at \$286 million. Membership rose to 65 Members and investments were an estimated \$475 million in 2005. Current projections anticipate investments of \$489 million with continuing increased Membership in 2006.

Challenge Programs (CPs) were important in terms of substance, potential impact, and in their capacity to draw investments, with up to 9 percent of CGIAR investments being devoted to CPs. Reviewing the regional allocation of CGIAR investments, he said that the proportion of allocation to Sub-Saharan Africa had increased. In Asia and CWANA they were stable, and had declined in Latin America and the Caribbean.

He summarized six major activities that were completed in the CGIAR System since the last Stakeholder Meeting was held:

- the Science Council’s Priorities and Strategies exercise;
- studies by the Task Forces on Programmatic and Structural/Organization alignment beginning Sub-Saharan Africa;
- pilot year of the CGIAR Performance Measurement System;
- approval of the CGIAR Charter;
- expanding CGIAR Membership (Turkey);
- reforming the structure and rhythm of AGM.

In the field of communications, the CGIAR was directly involved in or maintained a presence at international outreach events in (in alphabetical order) Australia, China, Finland, France, Ghana, Japan, Nigeria, Sweden, Switzerland, Uganda, and at the United Nations. Seventeen publications with the emphasis on impact were produced. A new CGIAR web site was launched in January 2005 and continues to draw sustained public interest.

Innovations at the AGM were clearly evident at Marrakech. They included a regional media workshop conducted in Arabic – a first for the CGIAR -- with over 20 participants, a Youth Forum, Science Forum, Centers and Partners Exhibit, and video streaming.

Reifschneider said that the CGIAR was “ever evolving.” Arrangements were already underway to strengthen human resources, implement programmatic and structural alignment, simplify business, promote collective action by the Centers, improve governance, and strengthen and expand partnerships with civil society organizations and the private sector. These developments would all help to increase transparency, accountability, efficiency, efficacy, and impact.

(c) Overview of the World Food Situation

IFPRI Director General Joachim von Braun, in his biennial over view of the World Food Situation, pointed out that progress toward reducing hunger was slow in the past decade.

During the 1990s, developing countries reduced the number of undernourished people by only 9 million (FAO 2005a), representing a mere 1 percent of the total of undernourished people. The progress in reducing hunger has been uneven across regions and countries. While China has been able to cut the number of undernourished since 1990, the rest of the developing world shows increased hunger. The situation in Sub-Saharan Africa is particularly grim, with the number of hungry people increasing by 20 percent since 1990.

Similarly the number of underweight children is estimated to have increased in most parts of Africa between 2000 and 2005, while there were notable decreases in all other developing-country regions.

Micronutrient deficiencies pose a vast global health problem. Vitamin A deficiency, iron deficiency anemia, and zinc deficiency increase the probability of early death for children and women, impair IQ development in children, and lead to a large loss in quality of life, productivity, and economic growth in developing countries. These nutrient deficiencies are a key issue being addressed specifically from a crop technology innovation and delivery perspective by the HarvestPlus CP.

Iron deficiency anemia affects 70 percent of nonpregnant women in India and almost 50 percent in Sub-Saharan Africa. Vitamin A deficiency affects the immune system of approximately 40 percent of children under five years of age living in developing countries and leads to approximately 1 million child deaths

every year. In some countries the impact is more severe; in India almost 60 percent of preschool children suffer from vitamin A deficiency.

Additionally, hunger has been exacerbated over the past year by several natural disasters (such as the tsunami and earthquake in South and Southeast Asia), and man-made causes (such as the conflict in Darfur and the failure to respond to the famine in Niger in a timely fashion);

On the positive side:

- Large developing countries, especially Brazil, China and India increased investments in poverty reduction in 2005;
- At the Group of Eight Summit, leaders agreed to double aid for Africa by \$25 billion by 2010 and cancel 100 percent of the multilateral debts of the highly indebted poor countries.
- With the adoption of the Millennium Development Goals (MDGs) poverty has climbed to the top of the global development agenda.

Von Braun urged, however, that if the international community hopes to achieve the targets for reducing hunger and malnutrition as set out in the Millennium Development Goals (MDGs) adopted at a global summit, “we must do more.” He proposed four key actions:

- strengthening governance of the food and agriculture system at the global, country and local levels;
- scaling-up public investment for agricultural and rural growth;
- taking targeted steps to improve nutrition and health, and
- creating an effective global system for preventing and mitigating disasters.

He said that the international community will need to develop new insights into the complex interactions among agriculture, health, and lifestyles, and to adopt a stronger focus on gender issues. We will need to invest in appropriate insurance systems and social security policies. Bio- and info- technological innovations based on science for the poorest and marginalized will be critical. And natural resource constraints will need to be addressed to safeguard against new food security threats.

“We must push ourselves,” von Braun concluded.

Agenda Item 2: A Conversation with Ministers

FARA Chair Njabulo Nduli of South Africa and CGIAR Chair Ian Johnson jointly presided over “A Ministerial Conversation” at which four African policymakers stated their views on agricultural research for development. Under this over-arching theme they examined a range of issues including delivery systems for the products of agricultural research to reach poor farmers, and the inter-linked issues of productivity and natural resource management.

H. E. Prof. Mouhattane Mohamed, State Secretary of Rural Development, Morocco stressed the need for each country to develop its own research, geared to the requirements of its people. An attitude of openness was essential for this process with dialogue, consultation, and participation by “players” at different ends of the research to development spectrum. Consolidating and strengthening networks made it possible for resources to be effectively mobilized. He outlined the Moroccan Government’s approach to boost science-based agriculture. He commended FARA for its overall contribution to research and development.

H. E. Venancio Massingue, Minister of Science and Technology, Mozambique, emphasized the opportunities that agriculture offered a poor country struggling to achieve economic growth in post-conflict situations. He told the audience of the wisdom displayed by a freedom fighter who said that to succeed in the war on poverty scientists would have to transform themselves into soldiers whose most effective weapon would be new knowledge.

H. E. Adel Safar, Minister of Agriculture, Syria, described his Government's efforts to give agricultural research top priority. In this connection, he noted Syria's long standing relationship with ICARDA, and said that Syria had increased its support for agriculture by 40 percent. Syria had established several research centers to help farmers gain access to technologies that would help them improve water conservation and control land degradation.

H. E. Habib Sy, Minister of Agriculture and Hydrology, Senegal, asked the rhetorical question: Where is the global market? He emphasized the importance to poor countries of a strong marketing system. Poor farmers need all possible assistance to reduce market uncertainty which can destroy their livelihoods.

Agenda Item 3: Global Science and CGIAR Priorities

(a) Science for Agricultural Development 2005

Science Council member Lisa Sennerby-Forsse, in association with Science Council Chair Per Pinstrup-Andersen, launched "Science for Agricultural Development, Changing Contexts, New Opportunities," the first of a series of reports that will review and analyze research and development issues that are of particular relevance to the CGIAR System and its partners.

Sennerby-Forsse said that the aim of the 2005 publication is to share knowledge of trends and emerging issues in the application of science and technology to agricultural development. It is directed primarily at four international audiences: decision-makers, the public sector research community, the private sector research community and development practitioners. She pointed out, too, that the publication makes a strong link between science for development and the Millennium Development Goals (MDGs).

<u>Millennium Development Goals</u>
1. Eradicate Extreme Poverty and Hunger
2. Achieve Universal Primary Education
3. Promote Gender Equality and Empower Women
4. Reduce Child Mortality
5. Improve Maternal Health
6. Combat HIV/AIDS, Malaria and Other Diseases
7. Ensure Environmental Sustainability
8. Develop a Global Partnership for Development

Although only the first MDG is directly related to agricultural development, many other links exist. For instance, goal #3 is consistent with gender issues in agricultural research and development. Goal #7 is part of the post-UNCED approach to sustainable agriculture. If all the groups at whom the report is directed understand each others' approaches and aspirations a little better, the report would have contributed to achievement of goal #8, developing a global partnership for development.

Sennerby-Forsse reviewed some of the many changes, recorded in the report, that have characterized the application of science for development. Public investment in agricultural research has increased some 51 percent, from an estimated US\$15.2 billion in 1981 to US\$23 billion in 2000. Shares in global research expenditures have also evolved. Developing countries that accounted for 17.8 percent of investments in

1995 accounted for 21.5 percent in 2000. Conversely, the share of industrialized countries changed in the same period from 82.2 percent to 78.5 percent.

Substantial disparities exist, however, within different regions and groups. In 2000, France, Germany, Japan, and the US accounted for two-thirds of public agricultural research by industrialized countries. Brazil, China, India, and South Africa accounted for more than a quarter of all public agricultural research investments by developing countries.

Whatever the disparities, science for agricultural development has a good track record of delivering real benefits to poor farmers and consumers. The “miracle,” Sennerby-Forsse said, is that today’s farmers are feeding twice as many people as were fed four decades ago with the same land base.

Science continues to create emerging opportunities for further progress, as the following illustrative examples demonstrate.

Spillovers: science and technology spillovers have always benefited agriculture, and need to be incorporated in planning stages with improved use of relevant data;

Genomics: scientists can now produce genetic maps that pinpoint the precise location and sequence of genes. In rice cultivation, this could enhance future rice breeding programs to meet the demand of some 4.6 billion people by 2025;

Nanotechnology: potentially relevant to agriculture in areas such as energy storage, productivity enhancement, food processing, and pest management;

Information and Communications Technology (ICT): opens up new opportunities in bioinformatics and e-agriculture.

She cautioned, however, that currently climate change is the greatest threat to the global environment and therefore to agricultural development.

Partnerships and combined implementation, she concluded, could greatly enhance the potential future impact of the application of science to agriculture.

The full text of the Science Council report can be found at:
<http://www.cgiar.org/enews/december2005/scienceforagrdev.pdf>.

(b) CGIAR System Priorities

The Science Council (SC) initiated a process of System-level priority setting to help develop a more cohesive and better-focused, high-quality research program to alleviate poverty, hunger, and malnutrition.

The council’s intention was to link the establishment of priorities (and future priority setting) with monitoring, evaluation and performance measurement – all vital functions for the efficient conduct of agricultural science and to meet the goals of the CGIAR and its global partners.

The priority-setting process was both analytical and broadly consultative with stake holders – including NGOs, CGIAR Members, and scientists within the CGIAR System as well as in other research institutions i.e. both NARS and advanced research institutions.

The global context of priority setting was two-fold, consisting of world poverty concerns and world food concerns. Most poor people live in rural areas and depend on agriculture for their livelihood. An increasing proportion of the world’s population lives in urban areas, however, with continued urbanization in developing countries widely expected. The CGIAR will therefore have to use agricultural research as a

means of reducing both rural and urban poverty through economic growth, employment creation, cheaper foods, and improved quality diets.

Meanwhile, the fragility of natural resources requires that agricultural research be targeted toward technologies that enhance productivity while at the same time conserving natural resources. Advances in molecular biology, computing, and informatics present new scientific opportunities.

Against that background, the SC adopted three criteria to help identify priorities. These were:

- expected impact on CGIAR goals and the MDGs;
- degree to which research will lead to the production of international public goods; and
- comparative advantage of the CGIAR in undertaking the research.

Using these criteria, the SC defined 20 research priorities clustered around the following five priority areas:

1. Sustaining biodiversity for current and future generations;
2. Producing more and better food at lower cost through genetic improvements;
3. Reducing rural poverty through agricultural diversification and emerging opportunities for high-value commodities and products;
4. Promoting poverty alleviation and sustainable management of water, land, and forest resources; and
5. Improving policies and facilitating innovation to support sustainable reduction of poverty and hunger.

Pinstrup-Andersen said that research in these priority areas would enable the CGIAR to achieve its goals, and would also help in attainment of the MDGs. The SC proposes that the Centers should spend 80 percent of their budgets over the next three years on research and capacity strengthening connected with the five priorities. The additional 20 percent could be spent on innovative research and free-standing capacity strengthening outside the priority areas.

Pinstrup-Andersen said that the CGIAR would need to translate the priorities into a coherent set of research programs. The SC expected that the Centers would carry out their research in collaboration with a range of partners such as NARS, advanced research institutions, NGOs, and the private sector.

The full text of the “SUMMARY REPORT ON SYSTEM PRIORITIES FOR CGIAR RESEARCH 2015-2015,” may be accessed at: <http://www.cgiar.org/enews/december2005/scienceforagrdev.pdf>.

Issues raised in the discussion that followed the SC Chair’s presentation centered mainly on the need for broad consultation in the planning stages of implementation, the importance of determining accurately the potential of each proposed priority, the importance of climate change and land issues to poor farmers, and the fact that in addition to deploying science in the war on poverty it was imperative to provide poor farmers and developing countries with access to markets. The SC’s emphasis on poverty was strongly commended.

(Note: At the AGM05 Business Meeting, the CGIAR approved the new System Priorities for CGIAR Research 2005-2015, and agreed on a number of steps and mechanisms for transforming the proposed research priorities into a coherent CGIAR strategy.)

Agenda Item 4. CGIAR Priorities: Science for the Poor

Five parallel sessions provided further opportunity for more in-depth discussion of the new CGIAR research priorities formulated through a Science Council-led process. Jointly

organized by the Science Council and the CGIAR Secretariat, each session consisted of an expert presentation on a sub-priority area followed by panel and open discussion.

A summary report from each session is given in Annex 1.

Agenda Item 5. Strengthening Research-for-Development Capacities

Following the format of the sessions on CGIAR priorities, a second set of five parallel sessions were held focusing on a number of issues related to strengthening research-for-development capacities.

A summary report from each session is given in Annex 2.

Agenda Item 6. Summary of Key Messages from Parallel Sessions (Agenda Item 4 “CGIAR Priorities: Science for the Poor,” and Agenda Item 5 “Strengthening Research-for-Development Capacities”)

Drawing from the summary reports, SC Chair Per Pinstrup-Andersen presented a summary of the important points discussed and conclusions made in the two sets of parallel sessions. They were as follows:

CGIAR Priorities:

- (a) Sustaining biodiversity: *Conservation of indigenous livestock*
 - There is agreement that there is an accelerating erosion of livestock diversity
 - Conservation by utilization should be the focal point, exploiting new marketing opportunities wherever possible
 - Attention and support is needed to the endangered species, but there is a need to define exactly how it should be done
 - NARS have a key role to play in genetic characterization and conservation
- (b) Genetic improvement: *Genetic enhancement of selected species*
 - Broad recognition of new opportunities to combine the analytical power of molecular science for trait capture with conventional approaches and speed up the time for breeding research
 - High cost of new genetic improvement technologies; the associated issue of IPR on distribution of benefits; how to make appropriate technology available to low-income farmers at a reasonable cost
- (c) Agricultural diversification and high-value commodities and products: *Increasing income through fruit and vegetable production*
 - Development of a horticulture initiative should take the following into consideration: trends in global horticultural production, market systems, post-harvest systems, environmental impact, and safety standards
 - Question is still open on whether there is more to be done by the CGIAR focusing explicitly on post-harvest
 - Horticulture and the production of other high-value commodities is a knowledge-intensive business; long-term technical as well as market information is required by farmers
- (d) Sustainable management of water, land and forest resources: *Integrated land, water, and forest management at landscape level*
 - Protecting natural resources does not mean producing less; goal is productivity increases that are compatible with sustainable use of natural resources.

- Interdisciplinary approach incorporating biophysical and social dimensions in research on forest lands and water management
 - Scale in NRM research (e.g. landscape) should be defined in the process of contextualization and empirical research itself
- (e) Improving policies and facilitating institutional innovation: *Improving policies, institutions, and technologies to support sustainable poverty reduction*
- Poverty traps are an important factor to consider in the context of improving policies and facilitating institutional innovation and link that back to agricultural research and the impact of technology on low-income farmers
 - Improving policies and institutions require a combination of both biophysical and social sciences research

Strengthening Research-for-Development Capacities:

- (a) Farmers as research and technology transfer partners
- The value of participatory approaches in research and development, particularly in crop improvement, has been demonstrated; they are complementary to conventional plant breeding
 - Opportunities to expand their use should be explored.
- (b) Local, regional and global science capacity
- Agriculture is the only sector with a global research system
 - In the context of agricultural innovation systems, CGIAR has critical role in global knowledge management
 - Capacity building programs implemented by the CGIAR should go beyond training individuals; capacity resides in institutions.
- (c) Embedding research in a system of innovation
- Innovation systems should not be taken as a blueprint; it has to be tailored to the particular set of circumstances
 - Capacity to innovate is needed; ability to create networks, partnerships and other forms of collaboration is necessary for innovation systems to work properly
 - The CGIAR should get a good handle on the Centers' role in a number of different innovation systems; Centers should not end up doing things they are not best qualified to do.
- (d) Evaluation of CGIAR training
- Training requirements and impact of training should be looked at in the context of the very broad spectrum of activities that the CGIAR is involved in (i.e. across biological and social science disciplines, upstream and downstream research, etc.)
- (e) Scientific capacity and economic growth
- While traditional focus of research on staple foods has had and will continue to have great significance, there is a need to speed up diversification and improve competitiveness in rural economies
 - The challenge is how to bring the various actors (public and private) together in a way that can have the greatest impact of science on economic growth and poverty alleviation

Agenda Item 7. Strengthening Partnerships for Agricultural Development

(a) Perspectives from Central and West Asia and North Africa (CWANA)

- i. **Challenges and opportunities:** ICARDA Director General Adel El-Beltagy gave a comprehensive presentation on the challenges that the agriculture sector is facing in CWANA region. CWANA is a region which includes 55 countries accounting for the major proportion of world's dry areas. According to El-Beltagy, the foremost challenge of the region is rapid

population growth rate; current population of 750 million is expected to reach 1.5 billion in 2020. Poverty is high with about 132 million living on less than a dollar a day. About 41% of the total population is dependent on agriculture as source of livelihood.

From the standpoint of agricultural development, El-Beltagy said that the biggest constraining factor is scarcity of fresh water. Climate change scenarios point to an even drier (and hotter) region, particularly in West Asia and North Africa. Desertification and land degradation is a major threat to agriculture in the region. There is also an increasing risk of biodiversity loss in a number of important food crops. All these plus international trade issues (e.g. limited access to OECD markets) and structural reforms present major challenges to CWANA agriculture.

In addressing the above challenges, El-Beltagy highlighted the important role of agricultural research. He noted the following strategic approaches of agricultural research as pathways to alleviate poverty: through improved technologies for increasing production and sustainable conservation of natural resources; diversifying farming systems that reduce risk, increase resource use efficiency and improve return to the farmer; improved vertical integration from producers to consumers; and institutional and policy reform.

The ICARDA Director General cited a number of examples of the research work being done in the Center to address various constraints applying new tools of science, e.g. use of geographical information system (GIS) and modeling tools to devise more efficient water harvesting, low-cost water desalinization systems, biotechnologies/molecular tools for genetic enhancement to combat threats of biotic and abiotic stresses, expert systems, etc. Finally, he emphasized the value of partnerships among institutions (CGIAR Centers, NARS, CSOs) in finding solutions to problems besetting agriculture in the region.

- ii. **Views of CWANA NARS:** Abdel Naby Fardous, President of the Association of Agricultural Research Institutions in the Near East and North Africa (AARINENA) gave a presentation of the activities of his regional organization in support of the research programs of member institutions. Over the years, AARINENA has supported national agricultural research systems (NARS) in the region in capacity building through training programs, organizing technical and scientific workshops and conferences. A key achievement is the establishment of a regional agricultural information system (RAIS) with the support and active participation of GFAR, ICARDA and FAO/RNE. Another major activity is the establishment of crop research and development networks for essential crops which facilitate collaboration and information sharing. Networks for date palm, cotton, olive, and medicinal & herbal crops are fully operational. A biotechnology network and water use efficiency network are in the planning stage. AARINENA has also acted as a facilitator in bringing the views, aspirations and research priorities of the WANA sub-region to the attention of relevant international organizations, the donor community, and other partners.

Abdushukur Khanazarov, President of Central Asia and Caucasus Association of Agricultural Research Institutions (CACAARI) also gave a brief statement about agriculture in the CAC sub-region and CACAARI's role. The region has a long history of agriculture and people engaged in it have battled against a harsh climate characterized by low and unpredictable rainfall and extremes of temperature. Transitioning into a market-driven economy, CAC agriculture is an important economic sector, contributing around 15 to 40% of the countries' GDP. Kahanazarov mentioned the following as the most important challenges that the sector is facing: improving productivity, crop diversification, conservation of natural resources, salinity management, improving water use efficiency, and institutional capacity-building. He noted that much progress has been made as a result of CGIAR's effort to help the region in

addressing these challenges. The CGIAR program coordinated by ICARDA in CAC was started in 1998. He cited important achievements in crop varietal improvement and dissemination, development of technologies for improved management of water and soil resources, improving livestock production practices, and in capacity building. He also emphasized the important role that CACAARI is playing as a neutral platform to build research partnerships in the sub-region. He would like to see it further strengthened to pursue its mission more effectively.

(b) Perspectives from the Global Forum on Agricultural Research (GFAR)

GFAR Chair Mohammad Roozitalab shared GFAR's perspectives on strengthening partnerships for agricultural development. He started by pointing out the development and institutional dimensions that highlight the importance of partnership. From the development dimension, he mentioned globalization of economy and structural reform as key drivers and the fact that agricultural research has to meet multiple and more complex objectives. From the institutional perspective, he noted that partnership requires common goals and objectives, equitable sharing of responsibilities, trust building, additional resources, and time.

He reminded the stakeholder meeting participants that GFAR's role is to act as a catalyst and a convener under the guiding principles of complementarity, additionality, subsidiarity, inclusiveness, and partnership. GFAR's role in strengthening partnerships spans the whole research and development process, i.e. priority setting, consensus building, and program/project implementation. Roozitalab cited examples of how GFAR stakeholder groups are involved in each step of the process.

The GFAR Chair also brought to the attention of the stakeholder meeting the establishment of a young professional platform for agricultural research for development. A group of 70 young professionals from 20 countries met in Marrakech in conjunction with AGM and agreed on a platform to advocate for young professional's needs and beliefs with the objective of enhancing opportunities to contribute to strategic debates in agricultural research for development, facilitating communication between young and senior professionals, and broaden career opportunities.

(c) Perspectives from the CGIAR Private Sector Committee (PSC)

Usha Barwale-Zehr, Chair of the CGIAR Private Sector Committee (PSC), presented perspectives on partnerships in the private sector, the current and future focus of the private sector in agriculture, the current partnerships that exist with CGIAR Centers, and the PSC's activities to strengthen partnerships. She pointed out that the private sector has always worked in a partnership mode, with producers/farmers and with its marketing channel. She distinguished three forms of partnership which the private sector primarily engages in:

- public-private – more research done in public institution; a greater part of technology transfer takes place from public to private entities.
- private-private – include mergers, joint ventures, licensing and royalty agreements
- private-public partnerships – more research is carried out in the private sector and potential technology flow is from private to public sector.

Barwale-Zehr highlighted the fact that there is an overlapping in a number of research areas between the private sector and public institutions, including the CGIAR Centers. For instance, many private companies have increased focus on rice.

In terms of technology delivery, she cited three models: commercial business model, which is for profit; transitional market development model, which is facilitating until the market becomes profitable; and the humanitarian partnership for public good model. The last two have some requirement for public-private partnership, including funding.

The PSC Chair brought up a number of issues related to private sector partnership with the CGIAR: the presence of some level of hesitancy to engage in a partnership with the private sector; the PSC's role in providing inputs is underutilized; question of whether the CGIAR membership is ready for partnership with the private sector; need for clarity in roles; need for strong presence of the private sector in developing countries; and willingness to resolve IP issues.

In terms of PSC activities in 2005, the Chair informed the meeting participants of the high-level private sector-CGIAR dialogue involving the Center DGs and CEOs of several companies. She also reported briefly on the progress of the Scientific Know-How and Exchange Program (SKEP). Plans for 2006 include two workshops, on research strategy and management and on project stewardship.

Agenda Item 8. 2005 CGIAR Awards

In opening the 2005 CGIAR awards ceremony, the CGIAR Chairman noted that the awards are always a highlight of the AGM in that they recognize and they celebrate achievements and excellence in science, including in science communications.

The 2005 award nominations were evaluated by two distinguished groups. The science awards were evaluated by Per Pinstруп-Andersen, Dely P. Gapasin, and Paul Vlek. Abdelmajid Slama joined the panel in evaluating the nominations for the regional award. The nominations for the communication award were evaluated by communication and journalism educators and journalists including Latifa Acharbach, Darryl D'Monte, and Sylvia Nabanoba.

A new science award, the “**CGIAR Regional Award for Outstanding Agricultural Technology**” was introduced and presented at AGM05. It is given to a NARS scientist/researcher or research team in the region where the AGM is being held (CWANA in 2005). The recipient is one who has developed during the past five years an outstanding technology or research product that has actual or potential contribution to increased productivity or quality of agriculture, improved food quality and/or improved management of natural resources in the region.

Another first in the 2005 awards ceremony was the use of a combination of slides and short films/video to bring to the stakeholders a personalized glimpse of the award-winning research activities.

The following were the winners of the 2005 CGIAR Awards:

Regional Award for Outstanding Agricultural Technology: Moatasim Sidahmed for developing a cutter-and-feeder mechanism that allows mechanical harvesting of lentils, a drought-resistant crop rich in proteins and grown widely in the CWANA region. Moatasim is a scientist at the American University of Beirut. The award was conferred by Ian Johnson and Hamid Narjisse.

Outstanding Communications: Patricia Shanley for her work co-editing, in conjunction with Gabriel Medina, the book “Fruitíferas e Plantas Uteis na Vida Amazonica” or “Fruit Trees and Useful Plants in the Lives of Amazonians.” The book is a joint Embrapa (Brazilian Agricultural Research Corporation), Imazon (the Amazon Institute of People and the Environment) and CIFOR

publication. Patricia is a CIFOR scientist. The book presents environmental research generated by 90 Brazilian scientists, rural people, urban traders and policymakers in an accessible format for local communities. The approach is being replicated by researchers in Bolivia, Cameroon, Indonesia, and Peru. The award was presented by Ian Johnson and Latifa Acharbach.

Outstanding Scientific Article: Shaobing Peng and co-authors for the article “**Rice yields decline with higher night temperature from global warming**” published in the Proceedings of the U.S. National Academy of Sciences in 2004. Peng, a scientist from IRRI, and coauthors Jianliang Huang, John Sheehy, Rebecca Laza, Romeo Visperas, Xuhua Zhong, Grace Centeno, Gurdev Khush, and Kenneth Cassman provide the first direct evidence of decreased crop yields that result from increased night time temperatures associated with global warming. The research clearly shows for the first time that climate change will have a negative impact on food production in some tropical areas. Results are from a 12-year study led by a team of IRRI scientists and the research was conducted in collaboration with scientists from China, India, the Philippines, and the U.S.

Outstanding Partnership: Alternative to Slash-and-Burn Program for developing more environment-friendly farming techniques and slowing deforestation. Coordinated by the World Agroforestry Centre, the ASB program is a global partnership of over 80 institutions, conducting research in 12 tropical forest biomes (or biologically diverse areas) in the Amazon, Congo basin, northern Thailand, and the islands of Mindanao in Philippines and Sumatra in Indonesia. The Program encourages the use of technological, institutional and policy innovations while improving land use. **Thomas Tomich** ASB Global Coordinator received the award on behalf of the partnership.

Outstanding Scientific Support Team: Program for Sustainable Agricultural Production in Central Asia and Caucasus (CAC) Support Team. The CAC program convened by ICARDA is strengthening agricultural systems in Armenia, Azerbaijan, Georgia, Kazakhstan, Kyrgyz Republic, Tajikistan, Turkmenistan and Uzbekistan. Over 4000 scientists and farmers from these countries have benefited from technical training provided by the program. **Ilona Kononenko** received the award on behalf of the team.

Promising Young Scientist: Simon Paul Graham of ILRI for seminal research leading to the development of a novel, sensitive, and robust immunological assay that screens target parasite molecules causing East Coast Fever (ECF), a debilitating bovine disease that is the bane of pastoralists in Sub-Saharan Africa. Simon is working in partnership with the veterinary pharmaceutical company, Merial, and a leading human vaccine research group at the University of Oxford, UK. Simon’s work may also contribute to ongoing efforts to control tropical theileriosis cattle disease, affecting 250 million cattle around the world.

Outstanding Scientist: Ravi Singh of CIMMYT for developing “slow rusting” wheat varieties with improved resistance to an array of diseases such as leaf rust, yellow rust, powdery mildew, and spot blotch, among others. These improved wheat varieties, currently planted on 26 million hectares worldwide, have saved poor farmers an estimated US\$5 billion worth of production losses. Dr. Singh’s wheat-breeding project at CIMMYT aims to replace by 2010 over 60% of the rust prone developing countries spring wheat areas with high yielding durable rust resistant cultivars. Dr. Singh’s research group at CIMMYT has identified 10 diverse “slow rusting” genes.

Agenda Item 9. Science in Action

To set the stage for the visit of AGM participants to INRA-Morocco, Hamid Narjisse introduced a video which highlighted the issues of relevance to the region and provided a glimpse of the excellent work being done by INRA scientists and partners to address those issues.

Ian Johnson thanked all the participants and specially the Ministers from Morocco, Mozambique, Senegal, and Syria who took time out from their busy schedules to join the stakeholders and share their ideas on a number of important issues on agriculture and agricultural research. He added that the CGIAR was very much honored by their presence in the meeting.

A certificate of appreciation was presented to Hamid Narjisse and the staff of INRA for their extraordinary support to the CGIAR on the occasion of AGM05.

In his final remarks, the Chairman noted that the “CGIAR has a tremendous future ahead of it. It’s in a great shape, it’s doing great work, and it has got great people working for research and for development.”

Box 1

Sir John Crawford Memorial Lecture 2005

The 2005 Sir John Crawford Memorial Lecture, “The Dimension of Science and Technology for Development: Perspective from the Maghreb,” was delivered by Dr. (Ms.) Zohra ben Lakhdar, Director of the Laboratory of Atomic-Molecular Spectroscopy and Applications at Tunis El Manar University, Tunisia, and winner of the prestigious 2005 L’Oreal-UNESCO “Women in Science” Award.

The lecture, delivered in French, was a magisterial presentation on the evolution of knowledge, importance of science and research for national development, and the imperative of developing and sustaining a culture of science in Africa.

Describing the evolution of science and technology, she noted that human beings had conquered outer space, cracked the genetic code, and performed elaborate cloning experiments. These developments were facilitated by the microscope, camera, telescope, and satellites. For her, knowledge was the basis for human evolution, and knowledge is based on rationality. This rationality, in turn, is based on science, and the evolution of science made knowledge go forward. Therefore, science is at the very core of human development and the big challenge is to find a way to make science the driving force for ameliorating the quality of human life while protecting the environment.

Speaking on the issue of science and technology for the Maghreb region, Prof. Lakhdar felt that 90 percent of the knowledge the Maghreb region is witnessing was acquired in the last 50 years. Lamenting the dearth of scientific talent, she said that there were only 200 scientists and researchers for every one million inhabitants in the Maghreb. In industrialized countries, comparable numbers were in the 2,500 to 3,000 range. Moreover, she felt a critical mass of specialists is necessary to produce leadership in innovation, and public investment is critical in this area. For example, Tunisia allocates only 1 percent of GDP for research, while France invests more than 2.3 percent.

Technology was being developed at high-speed and at a high pace, and coupled with the universality of knowledge, she noted all these elements are in a world of competition. She felt it was extremely important for developing countries to position themselves strategically in this intensely competitive environment.

Sharing details of her own odyssey, Professor Lakhdar said it was her family’s support and encouragement and the belief of both her uneducated parents that knowledge “has first place,” which made it possible for her to develop her own career and to go on to work for nurturing her country’s research capacity.

One of the ideas she raised in the lecture related to encouraging retired senior scientists to visit developing countries and encourage students and help to supervise young scientists to pursue science and research. She had tried this in her own labs, asking French and German scientists to come to Tunisia for a few weeks to help supervise students and researchers and to further develop a “culture of science.” She spoke passionately about the role of women in science, noting that women constitute 50 percent of the human population and their participation is crucial for the development of science and technology.

Many developing countries need to nurture a scientific environment to encourage students. More scientific cooperation and exchange programs are needed, including an International Centre for Optics and Photonics similar to the one for physics in Trieste, Italy where very bright students can meet world-class scientists, receive training, and strengthen their research capacities. This way, their enthusiasm would not get stifled due to a lack of resources, she said.

Her advice to young people in developing countries wanting to pursue science in the face of limited encouragement and resources was cogent: Persevere, work hard, do very good work and always compare yourself to the best. Following her presentation, a vigorous question-and-answer session ensued.

The *raison d'être* of the Crawford Lecture is to challenge CGIAR stakeholders to think outside the proverbial box. Professor Lakhdar's lecture not only met but surpassed that goal.

Summary Report from Parallel Sessions on CGIAR Priorities

Session 4 (a). Sustaining Biodiversity: *Conservation of indigenous livestock*

Co-Chairs: Peter Core (Australia)
Majd Jamal (Syria)
Keynote Speaker: Roger Blench (Mallam Dendo Ltd, UK)
Discussants: Carlos Seré (ILRI)
Virender Chopra (Science Council)
Romano Kiome (Kenya)
Recording Secretary: Robert Chapman (SC Secretariat)

Key issues:

- Focus should be given to conservation by utilisation, exploiting new marketing opportunities (e.g. organic produce) where possible.
- Further attention and support needs to be given to endangered species although ex situ approaches are more difficult than for plant conservation.
- NARS have a key role to play in genetic characterisation and conservation.
- The capacity and resources of national programs needs to be significantly increased.
- International, regional and national policies for livestock conservation need to be more coherent.

Presentation:

- There is a correlation between poverty and high degree of genetic diversity; the poor use it to manage risk more effectively; exploit micro-niches, produce a diverse range of products and add flexibility to the application of labor.
- Livestock is being eroded due a combination of changing economic, ecological and social conditions. Government and donor interventions have also tended to focus more on short-term gains than long term viability.
- National institutions should take responsibility for genetic heritage although farmers are best able to conserve livestock within a system at the landscape level through utilisation.
- Livestock breed conservation is a global public good and currently there are a number of factors accelerating erosion indigenous livestock diversity such as the promotion of high input – high output breeds in inappropriate areas; specialisation in single traits; genetic introgression; technical change (e.g. farm machinery); economic change; environmental change; political instability and natural disasters.
- Livestock policies: need to be coherent with regional policies and avoid contradictory policies on improved breeds; a framework needs to allow input from evolving science.
- Policy re-orientation: National research institutes need to be re-oriented towards indigenous livestock, focus on co-conservation and co-exploitation approaches, exploration of new domesticates and semi-domesticates and the conservation of wild relatives. Inventory projects (e.g. DADIS/DAGRIS) can be the focus for breed characterisation and breed conservation status. Particular focus should be given to regional genetic traits such as disease resistance.

Discussion:

- Definition of the poor needs to be considered including the poor as consumers and the urban poor. There are trade offs between an urban and consumer focus and a rural focus.
- The livestock economy is increasingly dynamic and changing so rapidly that farmers now have to respond faster than ever before. Co-evolution used to occur over much longer periods.
- The poor are maintaining the genetic diversity for all but it needs to be viable for them to continue.
- Hotspots of livestock diversity can be useful but genes and breeds can also be considered separately with a long term focus on genetic resources.
- Policy is very complex and much more work needs to be done in this area.
- Capacity building is required
- FAO is mobilising international efforts in this area.
- Need to address issues such as why conserve, who should conserve and what to conserve?
- A high proportion of the genetic resources are in developing countries and they need to continue to be available in the future.
- The conservation effort is both immediate and long term.
- Organic production and other marketing opportunities should be fully explored.
- Recent PRGA (SWEP) workshop stressed the need for more appropriate policies at the international level and the need for more specific policies on animal genetic resources.
- ILRI cannot manage all the genebanks and breed characterisation that is required at the national level. National capacity must be improved.
- There has already been considerable erosion of indigenous livestock and greater co-operation now is needed to make up for lost time.
- Genes and gene pools are very valuable resources especially for coping extreme climatic variability. Breeds provide a better focus for resource mobilisation.

Session 4(b). Genetic Improvement: *Genetically enhancing selected high-value species*

Co-Chairs:	Denis Kyetere (Uganda) Campbell D. Davidson (Canada)
Keynote Speaker:	Peter Langridge (Univ. Adelaide, Australia)
Discussants:	Pamela Anderson (CIP) Mike Gale (Science Council) Christophe Kouame (for Tiemoko Yo)(CNRA, Cote d'Ivoire).
Recording Secretaries	Jenny Nasr (Science Council Secretariat) Maurizio Ragazzi (World Bank)

The purpose of this session was to discuss Priority area 2 of the CGIAR System Priorities (Producing more and better food at lower cost through genetic improvements), with special regard to Priority 2d (Genetically enhancing selected high-value species).

The keynote speaker analyzed genetic improvements, dealing particularly with the challenges and limitations of marker assisted selection. On this, he concluded that markers offer significant improvement in sophisticated breeding but their application remains uneven. Among the future directions the speaker identified were a shift in the balance of technologies, a move from trait-based to recombination-based selection, an improvement of techniques to identify diversity, management of alleles at target loci, and a targeted use of gene interventions. Commenting on the keynote speaker's presentation, the three panelists discussed the impact of genetic improvement on breeders' income, the breeding improvement aspect of the green revolution, and the institutional challenges for a better use of technology. These comments were followed by a lively exchange among the participants, with more than ten interventions particularly from Morocco and other African NARS and the Rockefeller Foundation, which inquired about the role of the CGIAR, proprietary implications for property rights, licenses and rules. CIP replied that conventional breeding is a must even if the market is moving to molecular engineering and expressed growing concern in finding plant breeders nowadays. A participant from ICRAF pointed out that the session should have been on priority 2a instead of 2d. He also asked why some species were neglected over others, and how the current breeding programs would be useful to developing countries.

The Co-Chairs drew a number of conclusions from the presentations and the ensuing discussion, namely (a) the important role of new technologies for breeding programs, (b) the challenges arising from the target of feeding the world in the years ahead, (c) the crucial role of the CGIAR in enhancing fruitful interaction among the players involved, (d) the heavy costs of new technologies, (e) the challenge of providing a growing body of information back to the breeders, and (f) the need to explore the impact of intellectual property rights on the distribution of benefits.

Session 4(c). Agricultural diversification and high-value commodities and products:

Increasing income from fruits and vegetables

Co-Chairs: Arturo Vega (Colombia)
Denis Despreaux (France)
Keynote Speaker: Thomas Lumpkin (AVRDC)
Discussants: Douglas Pachico (CIAT)
Ken Fischer (Science Council)
Usha Barwale (PSC)
Recording Secretaries: Maria Iskandarani (CGIAR Secretariat)
Daniel Rocchi (CGIAR Secretariat)

Key issues:

- Important to recognize that investments in fruit and vegetables production do not only have an income growth dimension, but are also important for improving the nutrition of the poor; however, improving nutrition is not only a matter of availability and access to fruits and vegetables, but is also a matter of educating people about its nutritious value
- Need to carefully think about research niches that the CGIAR should be focusing at in the area of high value- commodities (e.g. indigenous, neglected crops) and impact on poverty alleviation
- Necessary to examine and capture the expertise and knowledge that is already available before embarking on new research on high-value commodities and make sure that efforts are not duplicated
- Think through the chain of value creation (quality seeds, plant breeding, biotech, seed delivery, post harvest technologies)
- Help farmers to manage risks in the high-value commodity market (e.g. pricing regimes)
- Study challenges and opportunities of creating market niches through labeling/certification
- Water is a critical factor, in terms of pollution (through high use of pesticides) and transfer of diseases; risk associated from the consumption of produce with pesticides residues
- IP regimes need to be in place

Session 4(d). Sustainable Management of Water, Land and Forest Resources.

Chair: Ruth Haug (Norway)
Keynote Speaker: Elias Fereres (University of Cordoba, Spain)
Discussants: Frank Rijsberman (IWMI)
Lisa Sennerby-Forsse (Science Council)
Recording Secretaries: Shey Tata (CGIAR Secretariat)
Masayoshi Saito (CGIAR Secretariat)

Summary of Key Points and Conclusions:

1. System Priorities endorsed. The priorities are not necessarily new; rather they are an attempt to gain efficiencies and sharpen focus for greater impact.
2. Implementation is the challenge:
 - Accommodating the cross cutting issues of health, climate change, gender, participatory approaches, capacity strengthening etc.
 - Integration is needed among biophysical/technical and institutions/policy. What is required is an interdisciplinary approach that also recognizes the inclusion of socioeconomics, policy and institutions. The system priority number 4 should not be interpreted in a limited technocratic way leaving policy out and thinking that policy is sufficiently covered in the priority number 5.
 - Dichotomy of basic versus applied research is false, or at least not very useful for integrated natural resource management (INRM) which needs a double filter of (i) relevance to real problems, and (ii) contributing to knowledge. CGIAR should involve itself in both upstream and downstream research seeking a fruitful synergy between the two.
 - Time and effort should not be expended defining scale in advance; scale is an outcome of a problem-driving process of progressive contextualization and empirical research.
 - The proposed allocation to “blue sky” research is unrealistic given the present funding modalities in the CGIAR.

Session 4(e). Improving Policies and Facilitating Institutional Innovation: *Improving science and technology policies and institutions*

Co-Chairs: Hamid Narjisse (Morocco)
Franklin Moore (USAID)
Keynote Speaker: Christopher Barrett (Cornell University)
Discussants: Joachim von Braun (IFPRI)
Ruben Echeverria (Science Council)
Njabulo Nduli (South Africa)
Recording Secretaries: Florencia Tateossian (CGIAR Secretariat)
Salah Brahimi (CGIAR Secretariat)

The keynote presentation focusing on “Poverty Traps and Agricultural Research: Improving Policies, Institutions and Technologies to support Sustainable Poverty Reduction”, served as the basis for a discussion on CGIAR Priority 5: Improving Policies and Facilitating Institutional Innovation, and particularly 5A: Improving science and technology policies and institutions.

The emerging body of knowledge confirms the existence of poverty traps, even if this term is more widely used than is precisely understood. This in turn has far-reaching implications for agricultural research in general, and the CGIAR research priorities in particular.

Case studies extracted both from the main presentation and the interventions of discussants point to the fact that sustainable poverty reduction depends upon research, including on policy and institutions and this has consequences for setting both biophysical research priorities and social science priorities (which seem to constitute a weak point within the CGIAR’s current research portfolio).

Poverty reduction efforts depend on research identifying appropriate technologies as well as avoiding over-simplification in modelling efforts: indeed the analysis needs to be multi-dimensional, integrating, social, anthropological, geographical, educational, gender, equity, political empowerment, and economic assets parameters, and productivity potential, amongst other things. The poverty traps concept seems to be underpinned by issues of dynamics, risk (vulnerability through dependence on fragile natural environments), exclusion factors, inherent multi-dimensionality of the challenges faced by the poorest of the poor, and various scales of analysis (micro, meso, macro).

The multitude of parameters must not impede efforts aiming at focusing the research agenda on key priorities as it would be impossible for the CGIAR to cover the breadth of these research challenges. Indeed, this should lead the CGIAR to cooperate more closely with NARS which have the capacity of delivering strong social science components with greater proximity and access to the societies they serve. One of the challenges will be an ethical one for donors on deciding to invest possibly in more costly commitments to raise those poor who find themselves in these complex poverty traps. Another challenge is to ensure that the research outputs themselves are made accessible and given the necessary visibility to be effective.

Summary Report from Parallel Sessions on Strengthening Research for Development

Session 5(a) Farmers as research and technology transfer partners

Co-Chairs:	Joy Hutcheon (UK) Romano Kiome (Kenya)
Keynote Speaker:	Salvatore Ceccareli, ICARDA
Discussants:	Farmers: Mohammed Al Saqua (Jordan) Abed El Latif El Khaled (Syria) Kewila Omar Kewila Hamad (Egypt) Kanayo Nwanze, WARDA
Recording Secretary	Florencia Tateossian (CGIAR Secretariat) Daniel Rocchi (CGIAR Secretariat)

Key points:

- Participatory plant breeding (PPB) represents a new paradigm and a new model for agricultural research that is complementary to conventional plant breeding
- It is important to involve national agricultural research systems into the PPB process
- PPB is generally understood for small farmers' production, but can also be applied for mass production if the seed industry is interested in using this approach.
- PPB is also beneficial for the farmers as it gives them moral as well as financial recognition
- PPB recognizes the power of partnerships, as farmers are researchers and partners in technology advancement. However it is necessary to put this in a more comprehensive manner including examples from other parts of the world.

The session described the comparative advantages of participatory plant breeding (PPB) over conventional plant breeding methodologies through examples of breeding programs implemented by ICARDA and the Africa Rice Center. Three farmers from the CWANA region provided testimonies with their successful experiences in selecting the best plant varieties for their use.

Participatory plant breeding approach allows the democratization of science and facilitates the ownership and transfer of science outputs to farmers. Other plant breeding activities by other CGIAR centers could benefit from this approach.

Session 5 (b): Local, regional and global science capacity

Co-Chairs:	Marina Puccioni (Italy) Urooj Malik (ADB)
Keynote Speaker:	Martin Pineiro, Grupo CEO
Discussants:	William Dar, ICRISAT August Temu, World Agroforestry Centre, FARA
Recording Secretary:	Vicki Wilde, CGIAR Gender & Diversity Program

Keynote presentation

Dr. Pineiro acknowledged that science capacity was a wide subject and rather than discussing details he would provide an overview of key issues, including:

- agriculture as the only sector with a global research system
- the CGIAR and the public sector in both developing and developed countries have not integrated well with the private sector.

Four observations on global innovations:

1. Innovation had a big impact on global agricultural production. Innovation is critical in agriculture since agriculture is itself dependent on a fixed factor—land.
2. Impact has been heterogeneous between crops, countries and regions.
3. This heterogeneity is explained, in great part, by the utilization of technology and knowledge developed for temperate region commodities.
4. These technologies, although scale neutral, lead to economic concentration and regional inequalities.

Total factor productivity over the last 40 years shows that countries with over 1.65% performance had good infrastructure and a respectable national research structure, while those with below 1% performance are small countries where temperate regional production is not common. The main factor for productivity seems to have depended on the capacity of countries to access good global technologies. The winners have been large countries that have markets and engagement with the private sector.

The implication is that a global system is needed to mobilize technologies worldwide and to avail those technologies to small non-temperate countries.

The historical linear vision of research dissemination and adoption influenced the manner by which public institutions organized their research sector. But today, agricultural innovations have become much more complex and very dependent on science, and the central focus is global knowledge management. The CGIAR's central focus should be on knowledge management while also filling specific research gaps and assisting with the development of science policies and regulation.

In conclusion, research alone is insufficient and innovation, policy and institutional matters are becoming increasingly important. In terms of resources allocated to research, the public sector has the lion's share, but the private sector accounts for a sizeable amount. The private sector in developing countries has more resources than the CGIAR, while regional organizations have very little. But the CGIAR has concentrated on working with public sector organizations in developing

countries (and to a lesser degree with public sector organizations in developed countries). It is weak in engaging the private sector in developing countries.

Additional comments about the CGIAR were offered:

The CGIAR, though relatively small, is a fundamental player. In the past it captured technologies developed in the USA and Europe and adapted them to the conditions of the developing world.

But the context has changed:

1. What are the implications for knowledge management when half of it resides in the private sector protected by intellectual property?
2. How do we maximize our capacity for knowledge management in relation to the public sector in the developed world? For now, it's a weaker link than it was in the 70s with the move from science to applied research.
3. How do we identify our basic priorities for research? The work of the Science Council is a good step but more is needed.
4. What is the appropriate role for the CGIAR for policy and institutional development (given closure of ISNAR)?

Though an era of rapid change, the CGIAR and NARIS are changing only slowly, yet the role of agricultural innovation for development is much more recognized than it was 10 years ago. This presents an opportunity for more resources to push reforms. Innovation and policies in developing countries are difficult in terms of time, resources and capacity building. The CGIAR has a major role to play in that.

Discussion

Capacity building must be sustained in many ways – a science culture is needed. Priorities for capacity building include: (a) development of pro-poor technologies; and (b) facilitation of research via partnerships. The Future Harvest Centers are not development agencies - but their research is designed to strengthen them. The CGIAR is now re-examining its impact pathways, dedicating some 20% of resources to capacity building.

The CGIAR in its initial stages assisted NARS to pick up technologies and build up their capacity to implement research similar in quality to developed countries. This would have seen the CGIAR growing smaller as NARIS strengthened but this did not happen. Much of the capacity-building implemented by the CGIAR was focused on training individuals, which builds competence not capacity. Capacity resides in institutions not individuals. The capacity needed in the NARS (a term including universities and research institutes) is not capacity to absorb the knowledge of the CGIAR but to generate their own good quality knowledge, so that NARS become participants and generators.

With the proliferation of NARIs (over NARS), the consequence is that the number of partners has increased enormously but research effectiveness is very low. There has to be an explicit link between policies, innovations in science and technology and institutions.

Organizational scientists say institutions have a life cycle of 30 years—they grow, produce and then decay. Universities have however not followed this model. It may be that institutions decay because they lack the dialogue and exchange that comes with teaching. Is the structure of the NARIS efficient or should they restructure to integrate with universities?

Session 5(c) . Embedding Research in a System of Innovation

Co-Chairs:	Lijian Zhang (China) Marlene Diekmann (Germany)
Keynote Speaker:	Andy Hall (UNU-INTECH)
Discussants:	Masa Iwanaga (CIMMYT) Monty Jones (FARA)
Recording Secretary:	Enrica Porcari (CGIAR ICT-KM)

The keynote speaker's presentation focused on describing research as embedded in innovation systems. He compared agricultural innovation systems to agricultural research systems. By definition research is an integral part of a system of innovations. However, research is not in the center of an innovation system; there are many other players, such as farmers, policy makers, extension agents, CSO, private sector among many others. Knowledge is generated at all levels. Scientific research on its own is not sufficient – it needs to be complemented with other research (market, policy, extension, CSO), and supported by government policies and community actions.

In the concept of innovation systems, the capacity to innovate is not only a function of skills but one of networking. Partnerships and other forms of collaborations need to be used extensively. Demand-informed, partnership-based approach is essential.

Of particular importance is a renewed emphasis on capacity development.

Priority setting is a very important step in a system of innovation. The process of priority setting is changing from a static centralized approach to a more consensual, more participatory dynamic process.

Innovation system is not a blueprint – it is about looking at pools of expertise and seeing how they can be knitted together effectively. Innovation systems in South Asia may look very different from those in Africa.

It was pointed out that there are two theories to promote innovation: a linear and a system one. The two are not mutually exclusive but can be applied in different circumstances, as proven by the example of CIMMYT's approach to drought tolerant maize in Africa, where a linear approach was found more suitable.

Monty Jones affirmed that systems innovation is inseparable from research – there is need to recognize application of science as part of the systems of innovation, including scientists, extension workers, and market shopkeepers.

The panel looked at communication as a way to transfer knowledge from one to another and questioned what type of communication is most appropriate. While there is no magic solution for innovation systems, people interactions are always very important. It is crucial to pull together a variety of different sources of knowledge and to recognize that all different actors have knowledge that is relevant to the process of innovation.

Institutions in the sense of practices and norms are very important to the success of innovation systems. Changing the mentality of organizations is just as important as research. The factors influencing innovation are similar in the international research institutes and in the NARs.

Session 5(d). Evaluation of the CGIAR training

Co-Chairs:	Jafar Khalghani (Iran) Theo van de Sande (Netherlands)
Keynote Speaker:	Elliot Stern (Training Evaluation Panel)
Discussants :	Robert Zeigler (IRRI) Rajendra Paroda (APAARI)
Recording Secretary:	Beatriz del Rosario (SC SPME)

This session discussed the results of the study commissioned by the Science Council to “assess how far and in what ways the CGIAR System has provided and can best provide training that strengthens NARS capacity to undertake collaborative scientific research to realize the goals of poverty alleviation, food security and sustainable production.” The study provided convincing evidence of the relevance and quality of training activities carried out by the CGIAR, and effectiveness of training (at the individual and institutional levels). The following major issues were raised:

1. How to ensure that capacity is built for the next generation of scientists – CGIAR alumni are now prominent in leadership positions in many NARI/NARS – e.g. at Director/Senior Management levels. More degree oriented programs needed for young scientists.
2. Many developing NARS need HRD support from the CGIAR- there’s a need to do training needs assessment to identify demand- driven themes/areas rather than routine training. IT-based training should be tailored carefully to the needs and capacities of the NARS.
3. What should the nature of capacity building be in the CGIAR - The training- to-learning continuum in the CGIAR has evolved from instructional mode to network mode. The network mode is the best way to learn;
4. How should the CGIAR structure its capacity building based on the categories of the different countries (Unstable: Latin American cases (Bolivia and Ecuador), Under-resourced: SSA cases (Malawi, Cameroon and to a lesser extent Kenya), Rapidly developing: Asian cases (Thailand, Vietnam and rest of GMB);
5. Decentralization and devolution - Many NARS now have capacity and could be tapped as training providers in areas such as NRM. There is a need to position where the CGIAR could best fit;
6. What is the impact on the CGIAR itself- Many good CGIAR scientists are now elsewhere. While it is difficult to evaluate training in research, this move could be considered a form of technology transfer.

The session acknowledged the following distinctive competence of CGIAR in Training & Learning: integrated approach to solving problems of global importance; long-term research experience in the production and utilization of the mandate crops in different agro-ecological and social environments; unique germplasm collections of germplasm and related institutional knowledge; worldwide network of collaborators; and capacity to act as apolitical ‘honest brokers’ and facilitators internationally and inter-institutionally. It welcomed and supported the 80-20 approach of the Science Council and the priority accorded to capacity building, recognizing capacity strengthening as intrinsic part of the on-going research. The Centers are encouraged to invest core funds in capacity building and training.

Session 5(e). Scientific capacity and economic growth

Co-Chairs:	Njabulo Nduli (South Africa) Willi Graf (Switzerland)
Keynote Speaker:	Francois Bourguignon (The World Bank)
Discussants:	Silvio Crestana (Embrapa), Cesar Falconi (IDB) Rodney Cooke (IFAD)
Recording Secretary:	Maria Iskandarani (CGIAR Secretariat)

The keynote presentation, “Scientific Capacity and Economic Growth - Implications for the CGIAR”, briefly reviewed the structure of science and technology in developed countries, in emerging countries, and the scope R&D in poor countries low income countries.

In the light of the preceding analysis of the role of scientific and technological research in economic growth two questions arise about how the CGIAR can pursue its mission in low-income countries:

1. The first question relates to the bias towards food crops produced in less favorable zones in developing countries: Does this research really intend to have the potential to render the producers of these commodities in low developing countries more self-sufficient and/or more competitive?
2. The second question draws on the preceding one and relates to the need for diversification in the rural economy. How can the CGIAR research speed up the process of diversification and improved competitiveness of the rural economy:
 - By shifting focus from food commodities to high value exportable crops?
 - By expanding research from productivity to marketing and processing?
 - By promoting investment in rural infrastructure?

Key items discussed in response to those questions:

- It is important to acknowledge that the CGIAR has achieved significant impact with its traditional focus on staple crops
- Hybrid business environments (e.g. related to IP) may be a model to be considered
- Research in bio-energy (e.g. ethanol production from sugar cane) is an important opportunity to consider in the growth discussion
- There are different dimensions to be well thought-out in the context of the two questions posed:
 - country and regional specificities
 - time dimension or frame for the shift
 - distributional effects on income from the shift
- influence of trade agreements and changes of trade agreements
- effects from employments growth through introduction of high value crops
- explore different partnership models for research in high value commodities (including the public, private and civil society sector)

The priority setting of the CGIAR is based on the observation of what poor people do and the idea of improving just that in the first place. There are good arguments for supporting this choice. Key is that the CGIAR should be forward looking in their research agenda, also if the enabling conditions (e.g. trade agreements) are not matching the reality (yet).