When the winds of change blow, most people build wind-shelters. Only a few people build windmills.
Agriculture is back on the global agenda!
60-70% more food by 2050

- Cereal: 2.1 → 3 billion tonnes/yr
- Meat: 270 → 470 million tonnes/yr
Length of Growing Season will Decline Drastically

To 2090, taking 18 Climate models

Thornton et al. (2010) ILRI/CCAFS
Phil. Trans. R. Soc. B
One of the most challenging issues the world has ever faced:
Food production systems under pressure

- Produce more food and increase the nutritional value of food
- Make food accessible and affordable
- Unpredictable and unusual weather patterns and pressure to protect the environment given scarcity of water and arable land
- The majority of the world population will not live near where food is grown
Quo vadis?

- Agriculture is back on the agenda, now what are we going to do?
- Recognition of the importance of agriculture, rural development, and agricultural research is growing, but the road towards translating discourse into reality seems to be very long ...
- We should continue to advocate at the highest possible levels in order to secure funding to implement global agricultural development
- Agricultural research it’s only a small component of an agricultural development strategy, but a crucial one!
- Public research investment in LDCs continues to be concentrated on a few countries (Brazil, China, India, South Africa, Mexico, Argentina)
Global Agricultural R&D Investment Trends since 2000

SOURCE: Stads and Beintema (2010)
CGIAR: A Consortium of International Agricultural Research Centers
CGIAR Core Assets

- A group of 64 member countries and organizations addressing global development challenges through international agricultural research
- A critical mass of scientists with multidisciplinary knowledge of key agroecosystems
- An extensive global research infrastructure, including research stations representing many agro-ecosystems
- Global and regional research networks with strong links to national agricultural research and innovation systems
- Global collections of genetic resources held in trust for the world
For every $1 invested in CGIAR research, $9 worth of additional food is produced in the developing world

• The estimated rates of return on the CGIAR’s investment in all crop improvement research range from 39% in Latin America to more than 100% in Asia, the Middle East and North Africa

• Investments in the CGIAR to 2000 have increased cereal yields by 0.7-1.0% annually, reduced world grain prices about 20%, and prevented 13 million to 15 million children from being malnourished

• More than half of the improved varieties (rice, wheat, and maize) grown in Africa, Asia and Latin America contain germplasm originating from CGIAR research
CGIAR Impacts

• The economic returns to biological control of insect pests of the tropical root crop cassava-current value US$ 9 billion for research on the cassava mealybug-far exceed the CGIAR’s total investment in Africa since 1971.

• 3.5 million African farmers grow beans developed by CIAT and partners, about half of the total bean area in Eastern, Central and Southern Africa.

• More than 40,000 smallholders have adopted CIAT’s improved forages in Southeast Asia.

• Around 60 percent of rice varieties in Latin America originated from germplasm developed by CIAT.
Reduce poverty and hunger, improve human health and nutrition, and enhance ecosystem resilience through high-quality international agricultural research, partnerships and leadership.

After four decades of experience, the CGIAR has research competencies in:

- Improvement of crop and animal production
- Natural resource management
- Social sciences and agricultural policies
- Production systems to improve productivity in a sustainable manner
- Climate Change: adaptation and mitigation to its effects in agriculture
New approach: From impacts on development problems to research outputs

Assess
Development impacts on food security, environmental sustainability, poverty

Monitor and Evaluate
Measurable targets of direct development impact from collaborative research
Measurable targets for research and development outcomes

Deliver
Measurable output targets from collaborative programs
## CGIAR Research Programs

<table>
<thead>
<tr>
<th>Program</th>
<th>Leader</th>
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<tbody>
<tr>
<td>Integrated agricultural production systems for the poor and vulnerable in dry areas</td>
<td>International Center for Agricultural Research in the Dry Areas (ICARDA)</td>
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<tr>
<td>Integrated systems for the humid tropics</td>
<td>International Institute of Tropical Agriculture (IITA)</td>
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<tr>
<td>Harnessing the development potential of aquatic agricultural systems for the poor and vulnerable</td>
<td>WorldFish Center</td>
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<tr>
<td>Policies, institutions and markets to strengthen food security and incomes for the rural poor</td>
<td>International Food Policy Research Institute (IFPRI)</td>
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<tr>
<td>Wheat – Global alliance for improving food security and the livelihoods of the resource-poor in the developing world</td>
<td>International Maize and Wheat Improvement Center (CIMMYT)</td>
</tr>
<tr>
<td>Maize – Global alliance for improving food security and the livelihoods of the resource-poor in the developing world</td>
<td>(CIMMYT)</td>
</tr>
<tr>
<td>GRiSP – a global rice science partnership</td>
<td>International Rice Research Institute (IRRI)</td>
</tr>
<tr>
<td>Roots, tubers and bananas for food security and income</td>
<td>International Potato Center (CIP)</td>
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# CGIAR Research Programs

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<tr>
<td>Grain Legumes – enhanced food and feed security, nutritional balance,</td>
<td>International Crops Research Institute for the Semi-Arid Tropics (ICRISAT)</td>
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<td>economic growth and soil health for smallholder farmers</td>
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<tr>
<td>Dryland cereals: food security, better health and economic growth for</td>
<td>(ICRISAT)</td>
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<tr>
<td>the world’s most vulnerable poor</td>
<td></td>
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<tr>
<td>More meat, milk and fish by and for the poor</td>
<td>International Livestock Research Institute (ILRI)</td>
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<tr>
<td>Agriculture for improved nutrition and health</td>
<td>(IFPRI)</td>
</tr>
<tr>
<td>Water, land and ecosystems</td>
<td>International Water Management Institute (IWMI)</td>
</tr>
<tr>
<td>Forests, trees and agroforestry</td>
<td>Center for International Forestry Research (CIFOR)</td>
</tr>
<tr>
<td><strong>Climate change, agriculture and food security</strong></td>
<td><strong>International Center for Tropical Agriculture (CIAT)</strong></td>
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</table>
GRiSP—a global rice science partnership

- Nearly 900 partners
- Objectives: Break yield ceilings using genomics, breed drought and flood-tolerant varieties, and find innovative ways to get new varieties to farmers and make the rice sector more efficient and equitable
- Expected outcomes: By 2020 income gains of US$11 billion annually should lift 72 million people out of poverty and enable 40 million people to reach food security
Climate Change, Agriculture, and Food Security (CCAFS)

- More than 400 partners, including climate change research community
- Objective: Overcome threats to food security by identifying pro-poor technologies and policies for mitigation and adaptation
- Expected outcomes: By 2020, reduce poverty by 10%, lower number of malnourished rural people by 25% in targeted regions, and reduce greenhouse gas emissions by equivalent to 1,000 million tons of CO₂
CGIAR Program on Climate Change, Agriculture, and Food Security

- Adaptation to progressive climate change
  - CIAT
    - Adapted farming systems
    - Breeding systems to address abiotic and biotic stresses
    - Identification, conservation, and deployment of species and genetic diversity
  - Columbia University
    - Building resilient livelihoods
    - Food delivery, trade, and crisis response
    - Enhanced climate information and services
  - University of Vermont
    - Identify low-carbon agricultural development pathways
    - Develop incentives and institutional arrangements
    - Develop on-farm technological options for mitigation and research landscape implications
  - ILRI
    - Linking Knowledge with Action
    - Assemble Data and Tools for Analysis and Planning
    - Refine Frameworks for Policy Analysis
Place-based Field Work

West Africa: Senegal, Mali, Burkina Faso, Ghana, and Niger

East Africa: Tanzania, Uganda, Kenya, and Ethiopia

Indo-Gangetic Plains: Parts of India, Bangladesh, Nepal
CIAT’s Mission

To reduce **hunger** and **poverty**, and improve human **health** in the tropics through **research** aimed at increasing the eco-efficiency of agriculture

**Science for Impact**
Eco-Efficient Agriculture

Environmental
Resilient
Sustainable

Social
Fair
Equitable

Economic
Competitive
Profitable
About CIAT—some key facts

• Founded in 1967 near Cali, Colombia
• 750 staff, 400 professionals, 200 scientists
• Operating in three regions:
  o Latin America and the Caribbean (based at HQ, Colombia)
  o Sub-Saharan Africa (based in Nairobi) with activities in 28 countries
  o Southeast Asia (based in Hanoi) with activities in China, Vietnam, Laos, Cambodia, and Thailand
• Current budget of US$M 60
Research-for-Development Initiatives 2011

- Tropical Soils Management
- Climate Change & Ecosystem Services
- Rice
- Linking Farmers to Markets
- Bean
- Capacity Strengthening & Knowledge Management
- Cassava
- Decision & Policy Analysis
- Tropical Forages
- Genetic Resources & Biotechnology
AGRONATURA
Parque Científico CIAT
CIAT Science Park

Promoting innovation for development

CORPORACION BIOTEC
FUNDA CIAT
ICA
CLAYUCA
Cenicàña
CODER
Colombia 50% MAR
INVERMAR
CIAT
CIMMYT
Bioversity International
Fidar
Exciting things going on at CIAT

- Breeding of climbing beans adapted to lower elevations has facilitated large-scale adoption of improved bean varieties in Africa— a major contribution to food and nutrition security.
- Ongoing use of simulation modeling to support the development of climate change adaptation strategies for staple crops.
- Development of the African Soils Information Service (AfSIS).
Regional Biotechnology Platform

- Quicken integration of genomic technologies and cell research, with germplasm improvement and conservation
- Provide access to advanced technologies and enhance breeding capacities and skills
- Train new generation of researchers

Integration with germplasm banks

Integration with plant breeding

CIAT & Regional Infrastructures

- Phenomics
- Genomics
- Genetic modification
- Microarray
- Proteomics
- Sequentiation
CIAT Promotes Capacity Strengthening

- Global training in plant genetics, soil fertility, knowledge management, intellectual property, and seed systems
- Short- and medium-term training in LAC, together with strategic partners such as CATIE, EMBRAPA, CIRAD, IICA, universities, private sector, INIAs, FORAGRO
Topics Where We could Collaborate

- Genetic improvement
- Agronomy and tropical soils
- Health and nutrition
- Policy analysis, impact assessment
- Adaptation to climate change
Implementing Collaboration Opportunities

- Training of PhD students at CORNELL in research areas related to CIAT and the CGIAR
- PhD students from CORNELL could link their thesis work to CIAT’s research challenges
- Fresh graduates from CORNELL could do a postdoc at CIAT
- CORNELL professors could have sabbaticals-research visits to CIAT
- CIAT researchers could have research visits to CORNELL
- We could jointly mobilize resources to fund such activities
CIAT: Science for Impact

www.ciat.cgiar.org