Leading agricultural research institute in Africa

Regional hubs

West Africa – Nigeria
Central Africa – DR Congo
East Africa – Tanzania
Southern Africa – Zambia

120 scientists
15 countries

Annual budget 2013: ca 80 million USD
Main separate donors: USAID, BMGF
Ibadan, Nigeria, HQ & West Africa Hub
Founded in 1967
East Africa hub, Dar es Salaam, Tanzania

New science building, inaugurated May 2013
Central Africa hub, DRC

Kinshasa – offices

Bukavu – upgrading of labs
Southern Africa hub, Lusaka, Zambia

Campus foundation stone ceremony, 12 Sept 2013
Collaborating in 16 cross-cutting CGIAR Research Programs, CRPs
Partners & Stakeholders
Work with us for a food secure future. Consulted through the Global Conference for Agricultural Research for Development.

Consortium
Integrates and coordinates researchers and funders. The Consortium consists of the Consortium Board, Consortium Office and 15 research centers.

Independent Evaluation Arrangement
Evaluates the work of the CGIAR Research Programs.

Fund
Ensures funds for the research of the Consortium. The Fund consists of the Funders’ Forum, Fund Council and the Fund Office.

Independent Science & Partnership Council
Advises the Fund on research priorities and funding.
CGIAR System level outcomes

SLOs

1. Increased food security
2. Reduction of rural poverty
3. Reduction of under-nutrition
4. Sustainable management of natural resources
SLOs
1. Increased food security
2. Reduction of rural poverty
3. Reduction of under-nutrition
4. Sustainable management of natural resources

Impact by 2025
Increase yield 60%
Sustain annual growth 0.5%
Reduce poverty 15%
Vision of success

11 million Africans out of poverty
7.5 million hectares of land into sustainable use
Challenges

Food insecurity
Poverty
Gender inequity
Education
Youth unemployment => Rapid urbanization

Low/decreasing soil fertility
High incidence of pests and pathogens
Undiversified cropping systems

Limited/no access to inputs (seed, fertilizer, pesticides, extension, …)
Limited/no access to markets
Limited/no mechanization

Policies, institutions, markets

Climate change
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Climate change
Approach for impact

• Quality of research
• Research for development (R4D)
• Close collaboration with partners
  – National Agricultural Research Systems (NARS)
  – Regional organisations (CORAF, ASARECA, FARA)
  – Farmers and farmers’ organisations
  – Private companies
  – Universities and research institutes
  – Donors
  – Development organisations
• Capacity development
• Gender mainstreaming
Scientific profile

No. of scientists

Nutrition and health
Biometrics and bioinformatics
GIS
eResearch...
Gender

A member of CGIAR consortium
www.iita.org
Entry points for impact

Humid Forest
Cassava, yam, banana/plantain in WA and CA lowland
Cassava expansion in EA and SA
Entry points for impact

Humid Forest
Cassava, yam, banana/plantain in WA and CA lowland
Cassava expansion in EA and SA

Moist Savanna
Diversified maize-legume systems
Entry points for impact

Humid Forest
- Cassava, yam, banana/plantain in WA and CA lowland
- Cassava expansion in EA and SA

Mid-altitude Savanna
- Banana cropping systems

Moist Savanna
- Diversified maize-legume systems

Sahelian Drylands
- Area: 123 M Ha
- Population: 60 M

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www.iita.org

Entry points for impact

Sahelian Drylands
Cereal, cowpea and livestock integration

Mid-altitude Savanna
Banana cropping systems

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Moist Savanna
Diversified maize-legume systems
Entry points for impact

Sahelian Drylands
Cereal, cowpea and livestock integration

Mid-altitude Savanna
Banana cropping systems

Cross-cutting
High value crops
Vegetables, fruit, cocoa

Humid Forest
Cassava, yam, banana/plantain in WA and CA lowland
Cassava expansion in EA and SA

Moist Savanna
Diversified maize-legume systems

A member of CGIAR consortium www.iita.org
Entry points for impact

Maize

Roots, tubers and bananas
  Cassava
  Yam
  Banana and plantain

Grain Legumes
  Soybean
  Cowpea
### Maize

### Roots, tubers and bananas
- Cassava
- Yam
- Banana and plantain

### Grain Legumes
- Soybean
- Cowpea

#### Entry points for impact

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<thead>
<tr>
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<td>Integrated Soil Fertility Management</td>
</tr>
<tr>
<td>Systems sustainability</td>
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<tr>
<td>Nutrition</td>
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#### Crop improvement

- Value chains
- Gender
- Capacity development
- Innovation
- Climate change adaptation
Crop improvement - maize
Crop improvement - maize

"Orange maize"
Pro-vitamin A enriched maize
Project:
Harvest Plus, Biofortified crops
“The violet vampire”

Striga hermonthica

Parasitic weed
Maize, sorghum, cowpea
Severe crop losses

Project: ISMA
Integrated Striga Management in Africa
Kenya and Nigeria
Collaboration: IITA, CIMMYT, icipe
Funded by BMGF
Enhanced resistance to *Striga* in maize

**Nigeria**

- STR Hybrids
- Tolerant
- Susceptible
- Commercial

**Kenya**

- STR Hybrids
- Tolerant
- Susceptible
- Commercial

Emerged Striga count vs. Grain yield (t/ha)
Enhanced resistance to *Striga* in maize

<table>
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<tr>
<th>Variety</th>
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<td></td>
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Drought tolerant maize

Highest potential for increased maize production in West and Central African savannah due to:
- high solar radiation,
- low night temperatures
- low incidence of diseases

Constrained by:
- recurrent drought
- *Striga hermonthica*
- low soil fertility

Breeding goal: Early and extra-early maturing cultivars

Project: DTMA (Drought Tolerant Maize); BMGF, USAID; CIMMYT, IITA
Drought tolerant maize

Drought tolerance + *Striga* resistance

License Agreement: IITA and Pioneer
Cassava - an orphan crop
Cassava - a crop for the future!

Food security
Multiple uses
Well adapted to climate change
NEXTGEN CASSAVA

Genomic selection - faster breeding process
www.cassavabase.org - Open access database, hosted at IITA

Partners:
Cornell University, USA
IITA
National Crops Resource Research Institute, Uganda
National Root Crops Research Institute, Nigeria
Boyce Thomson Institute for Plant Research, USA
US Department of Energy (DOE) Joint Genome Institute (JGI)
Makerere University, Uganda

Funds: BMGF, UKAID (5 years)
Genetic structure of IITA cassava

40 years of field breeding and next generation sequencing

2000 SNP markers for 650 advanced genotypes reveal story of IITA germplasm development and contribution of breeding parents
“War against the viruses”

Meeting in Bellagio, Italy, June 2013
New Cassava Varieties and Clean Seed to Combat CBSD and CMD

- Virus-free cassava - dual resistance
  - cassava mosaic disease (CMD)
  - cassava brown streak disease (CBSD)
- IITA and NARS
  - Kenya, Malawi, Mozambique, Tanzania and Uganda
- BMGF - 2012-2016
Cassava brown streak disease
Cassava brown streak disease
Virus vector: Cassava white fly

Source: James Legg et al.
Introduced parasitoid (*Encarsia*) from cultures in CSIRO and USDA-ARS

Quarantine screenhouse
Kibaha, Tanzania,
Improved cassava varieties

Cassava transformation program of Nigeria

Double yields

- 20-30 t/ha (improved)
- 10-12 t/ha (local)
Mechanization of cassava processing
High quality cassava flour
40/60 cassava/wheat bread
President Goodluck Jonathan, presenting cassava bread from IITA to the public
Demonstration events

- Mechanical planter
- Boom-sprayer
- Knapsack sprayer
- Brush cutter
Linkages to service providers

Fertilizer depot

Fertilizer plant in Ebonyi State

Syngenta / Dizengoff

North-South Development micro-Credit schemes
International collections of major food crops in Africa

Cowpea (*Vigna unguiculata* L.) 15,379
Soybean (*Glycine max* L. Merr) 4,841
Cassava (*Manihot esculenta* Crantz) 3,499
Yam (*Dioscorea* spp.) 3,156
Bambara groundnut (*Vigna subterranea* L. Verdc) 1,752
Maize (*Zea Mays* L.) 1,565
Miscellaneous legumes 558
Wild Vigna (*Vigna* species L.) 1,543
Banana/plantain (*Musa* spp.) 546
African yam bean [*Sphenostylis stenocarpa* (Hochst.) Harms] 456

IITA Genebank
Cowpea vendors, northern Nigeria