



RESEARCH  
PROGRAM FOR  
Managing and  
Sustaining Crop  
Collections



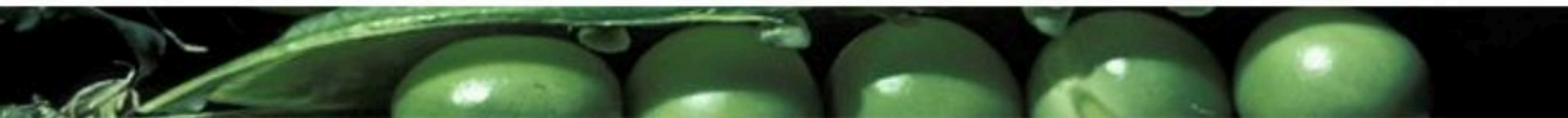
**GLOBAL CROP  
DIVERSITY TRUST**  
A FOUNDATION FOR FOOD SECURITY

# *CGIAR Research Program for Managing and Sustaining Crop Collections*



## Objective

To conserve the diversity of PGR in CGIAR-held collections, to make it available to breeders and researchers in a manner that meets **high international scientific standards**, is **cost efficient**, is **secure**, **reliable** and **sustainable** over the long-term and is supportive of and consistent with ITPGRFA



# International collections

- 1994 Commitment to hold collections  
“...in trust for the benefit of the  
international community”
- 2001 status reaffirmed in Article 15 of  
the ITPGRFA




# International collections

		Accessions
AfricaRice	Rice	19,538
Bioversity	Banana, Plantain	1,434
CIAT	Beans, Cassava, Tropical forages	67,089
CIMMYT	Maize, Wheat	170,035
CIP	Potato, Sweet potato, Andean Roots & Tubers	15,621
ICARDA	Grain legumes, Wheat, Barley, Forage & range crops	140,933
ICRAF	Trees	7,938
ICRISAT	Dryland cereals, Grain cereals	118,887
IITA	Banana, Plantain, Maize, Cowpea, Cassava, Yam	34,095
ILRI	Tropical forages	17,267
IRRI	Rice	117,164
<b>Total</b>		<b>710,001</b>





<b>Acquisition</b>
<b>Characterization</b>
<b>Safety duplication</b>
<b>Long-term seed storage</b>
<b>Medium-term seed storage</b>
<b>Field genebank</b>
<b>Maintenance of the cryopreserved collection</b>
<b>Introduction of new accessions into cryopreservation</b>
<b>Maintenance of the <i>In vitro</i> collection</b>
<b>Introduction or multiplication of accession in the <i>In vitro</i> collection</b>
<b>Germination testing (or viability testing)</b>
<b>Regeneration</b>
<b>Seed processing</b>
<b>Seed health testing</b>
<b>Distribution</b>
<b>Information and data management</b>
<b>General management</b>

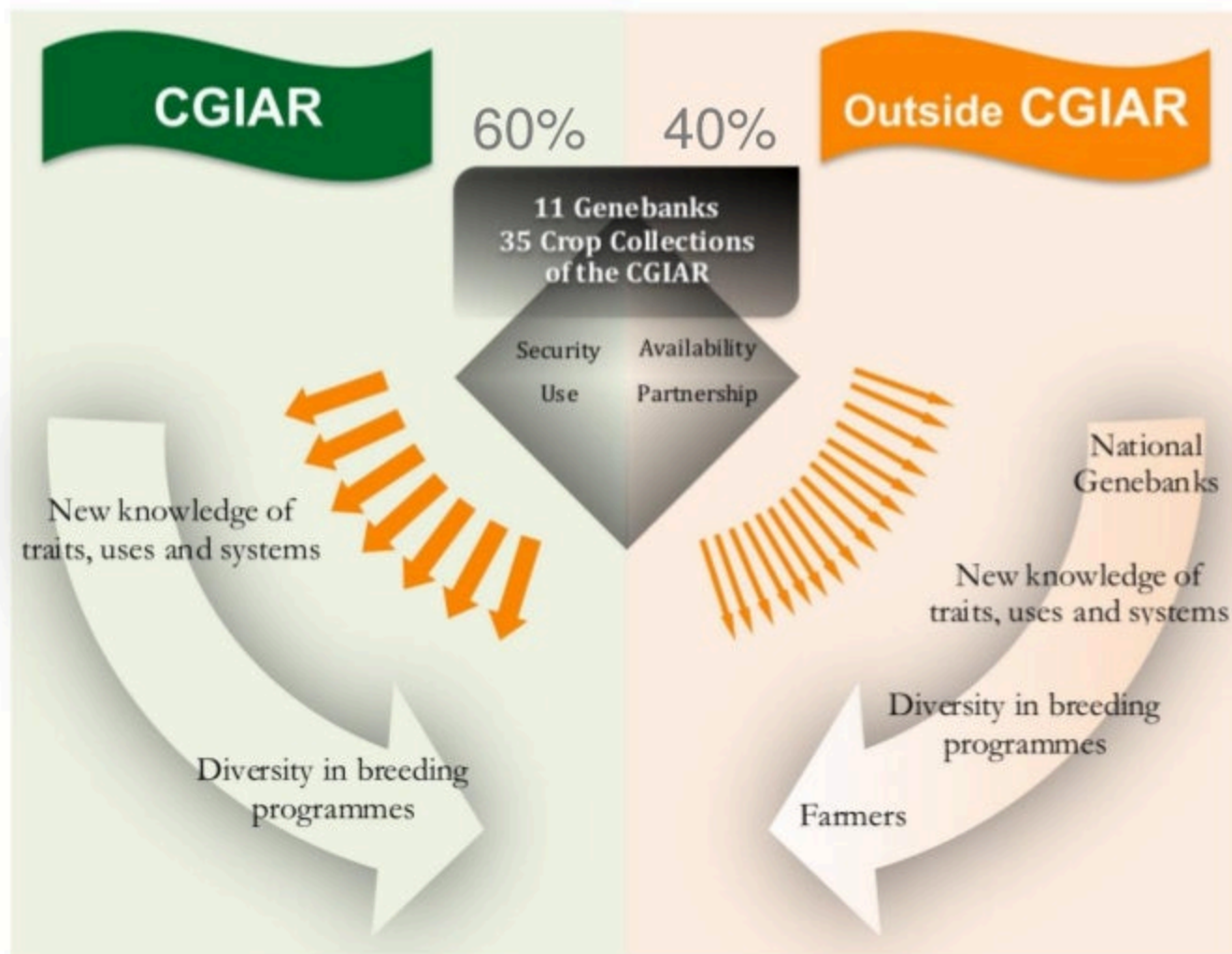


“About 60% of the food crop area planted to improved varieties is occupied by varieties bred using genetic materials from the CGIAR”



The 12 most popular accessions in the IRRI genebank have been used in more than 1000 crosses each



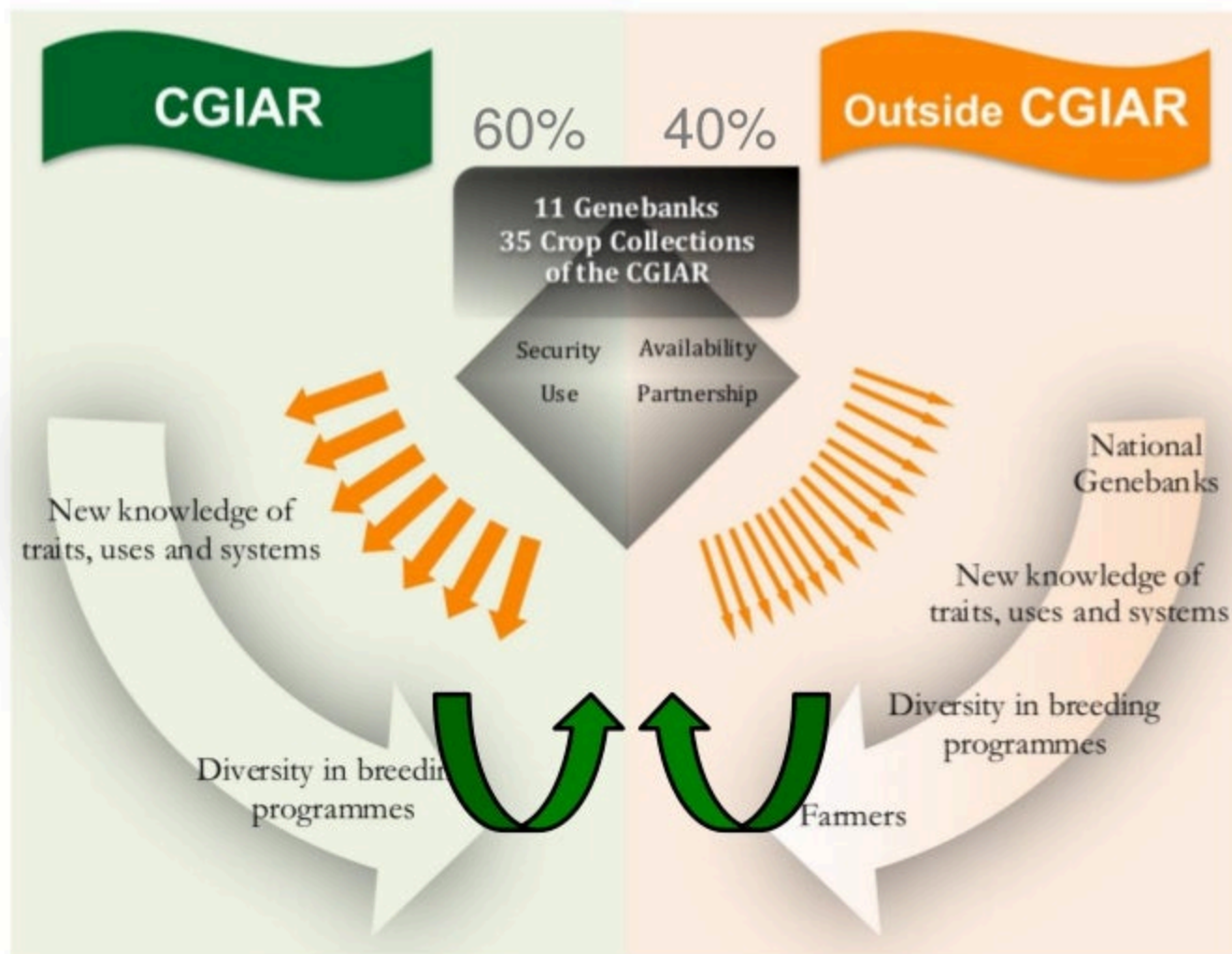


Use of diverse, clean planting materials of  
maize, wheat, rice, roots, tubers and bananas,  
grain legumes, dryland cereals, forages and trees  
in farmers fields



Common IDs





Use of diverse, clean planting materials of  
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Common IDs

## Common IDOs

- Improved productivity
- Increased and stable access to food commodities
- Increased consumption of safe, nutritious foods
- Increased capacity to adapt to variability, shocks and longer term changes
- Greater resilience
- Increased carbon sequestration and reduction of greenhouse gases



Should we have an *in perpetuity IDO* for conservation?

“The basis of food security is assured for future generations through the conservation, availability and use of crop diversity”

# Performance Management Indicators

?	Objective?	Indicator?	Current status?	Target?
<div>?</div> <div>Security?</div> <div>?</div>	Crop and tree diversity in international collections under Article 15 (ITPGRFA) is secured in perpetuity	Number seed accessions held in Long Term Store (LTS) and safety duplicated at two levels	60% total seed accessions	>90% by 2021
		Number RTB accessions in cryopreservation and safety duplicated	10% total clonal accessions	>50% by 2025
		Number of genebanks with validated facilities, procedures, standards and expertise	2 out of 11	11 out of 11 by 2021

?





# Performance Management Indicators

?	Objective?	Indicator?	Current status?	Target?
Availability?	Conserved crop and tree germplasm is clean, available and effectively disseminated?	Total number accessions that are currently available for distribution?	70% total accessions?	>90% by 2021?
		Number accessions with passport and characterization data available (online)?	55% total accessions?	>90% by 2021?

?



# Performance Management Indicators

	Objective	Indicator	Current status	Target
Use of crop and tree diversity is informed and facilitated		Number of distinct accessions distributed within CGIAR	61,645	100,000 distinct accessions are disseminated between 2012 & 2021 to users outside the CGIAR
		Number of distinct accessions distributed outside CGIAR	27,538	
		Total number of samples distributed	131,181	





# Monitoring & Evaluation

	2012				2013				2014				2015				2016			
	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q
PMI monitoring																				
Financial monitoring																				
External review	A		B		C		D	E	F	G		H	I	J		K				
Strengthening QMS																				
Annual meeting			❖				❖				❖				❖				❖	



#### Main menu

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IRRI Performance indicators 2011 Baseline Rice

[Attachments](#) [History](#) [Correspondence](#)

#### A.07 TABLE AS1 - Seed collection accession numbers

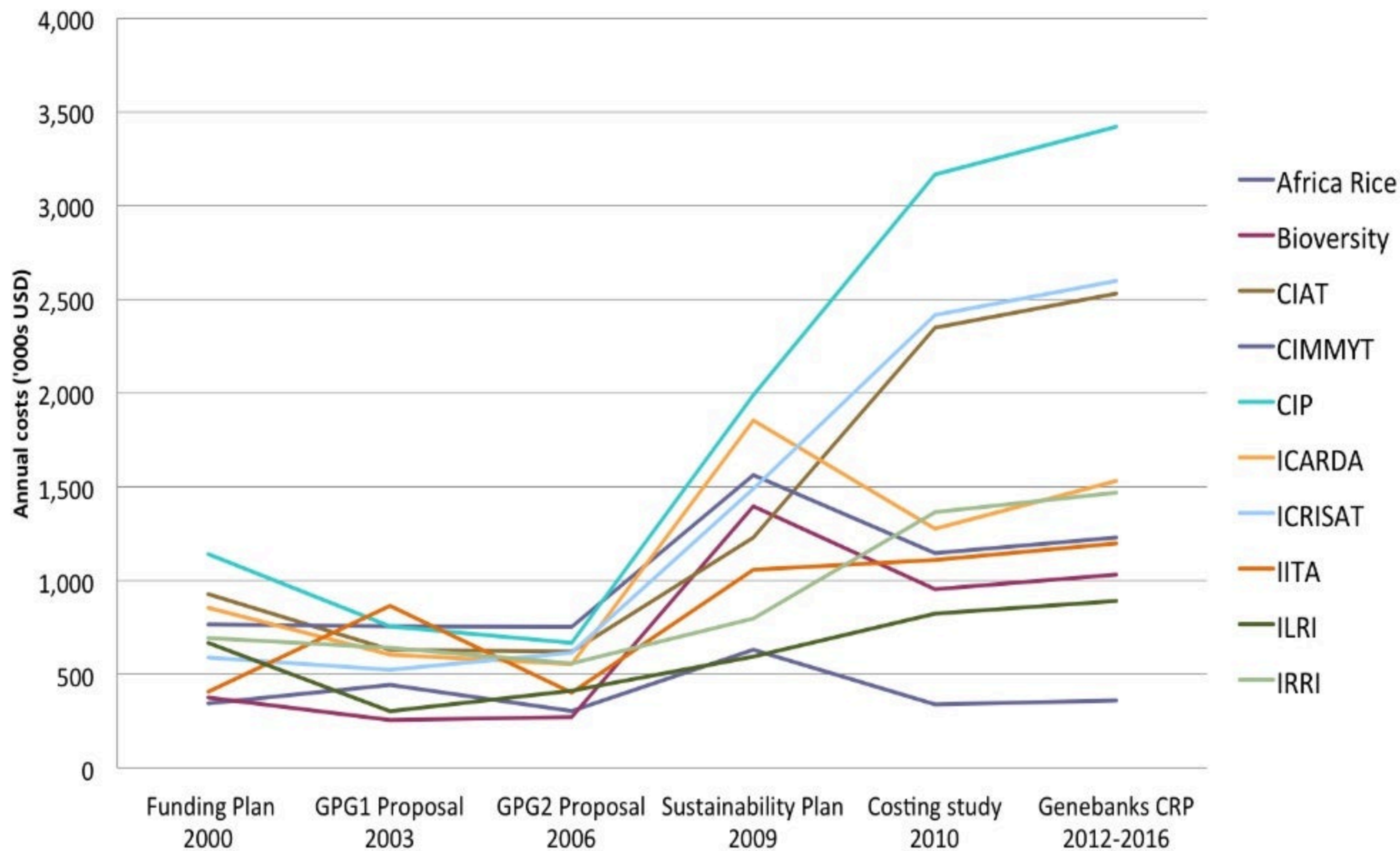
	LTS	MTS	Live plants	Summed total	Total number accessions counting individual accessions only once
Total number accessions in the costed collection	115,974	114,409	4	230,387	116,034
Estimated number of accessions that are unlikely to be well represented in other collections	93,445	91,889	4	185,338	93,637
Number of accessions legally available within the costed collection	110,076	108,519	4	218,599	110,267
Number of accessions of hosted black box duplicates	0	0	0	0	0
Number of accessions of genetic stocks within the costed collection	1,280	1,252	0	2,532	1,442
Number of additional accessions not formally part of the collection	0	0	0	0	0
Number of accessions with health status tested	61,651	61,617	0	123,268	61,651
Number of accessions with health status clean	61,517	61,483	0	123,000	61,517
Number of accessions with known viability	115,972	114,409		230,381	116,034
Number of accessions with acceptable viability	112,185	111,611		223,796	114,971
Number of accessions with acceptable seed number	111,546	110,614		222,160	113,927
Number of accessions with acceptable viability	0	0		0	0



# Monitoring & Evaluation

	2012				2013				2014				2015				2016			
	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q
PMI monitoring																				
Financial monitoring																				
External review	A		B		C		D	E	F	G		H	I	J		K				
Strengthening QMS																				
Annual meeting			❖				❖				❖				❖				❖	

## Evolution of genebank costs





# Monitoring & Evaluation

	2012				2013				2014				2015				2016			
	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q
PMI monitoring																				
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External review	A		B		C		D	E	F	G		H	I	J		K				
Strengthening QMS																				
Annual meeting			❖				❖				❖				❖				❖	



External expert reviewers from  
USDA, EMBRAPA, MSB, CGN,  
Bioversity



# Users are the key partners!

Includes everyone and anyone

- CRP scientists
- NARS
- ARIS & Universities
- Private sector, Individuals
- NGOs, Civil organizations, Farmers



Tropical forage collection at CIA





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Take it to the Farmers (TTF)

Wheat Yield Consortium (WYC)



International Maize Improvement Consortium (IMIC)



Genetic resources

Breeding

Cultivar adoption, agronomy

Increased agricultural production



**Seeds of Discovery (SeeD)**

Opening the bottleneck between GR and breeding programs



# MGIS Musa Germplasm Information System

e-mail

password

[register](#) [submit](#)

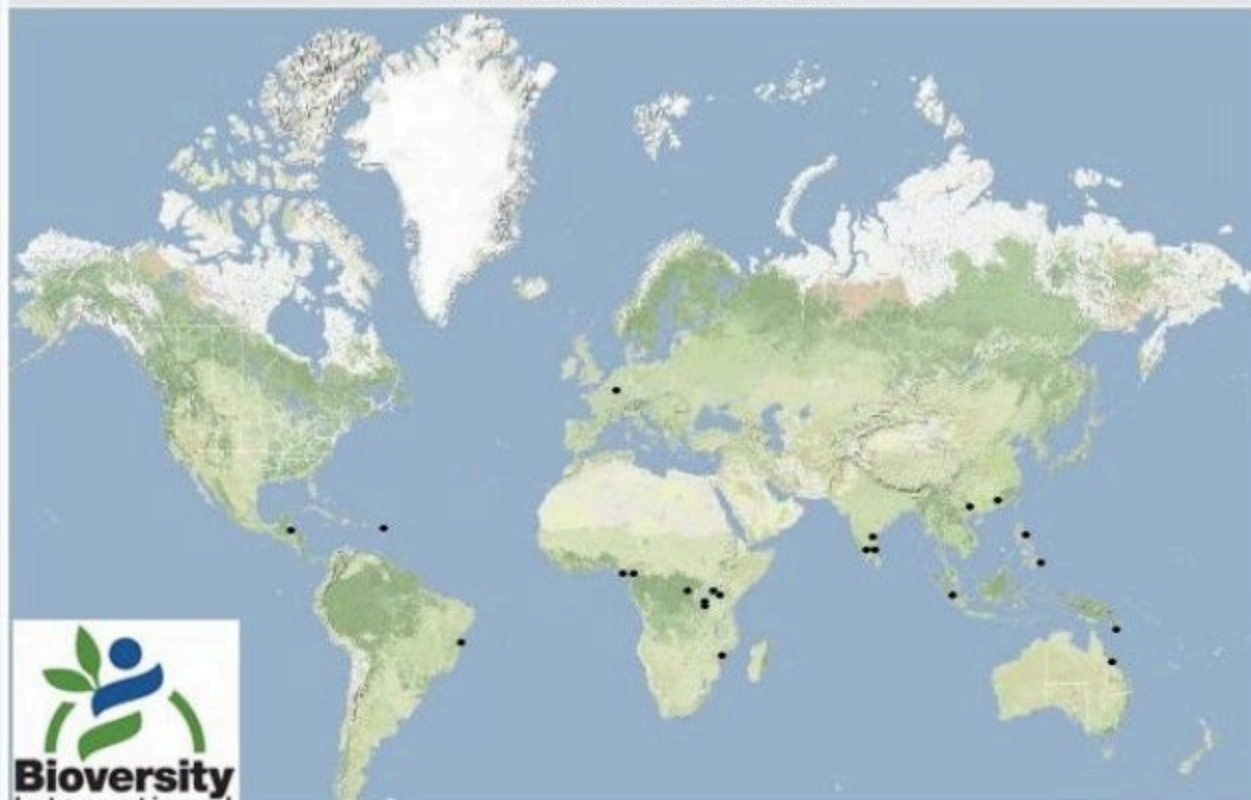
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[see basket contents](#)



Location of collect [Find](#) that provided data to MGIS

click on a collection for MGIS statistics



Bioversity International has established the Musa Germplasm Information System (MGIS) as a system for the exchange of germplasm data. MGIS is a database containing detailed and standardized information on the accessions stored in different Musa genebanks around the world ...



**barnesa Musaco**





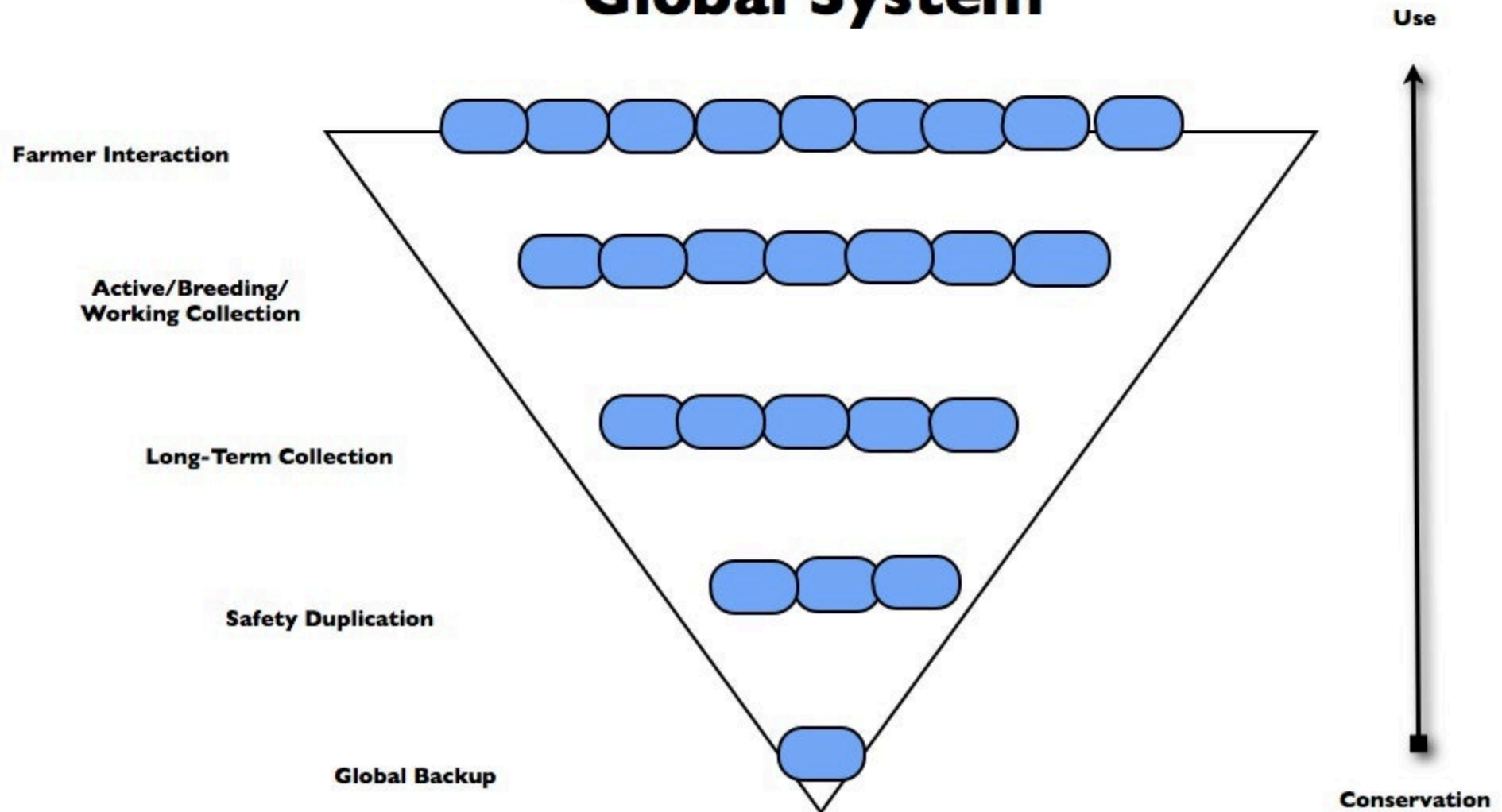
## BMGF Project


56 countries (12 non-Contracting Parties) safety duplicated 43,67 accessions



# Conventional System versus Global System

## Global System



 = Institute

# GeneSys



Search for Taxonomy or Identifier(s)

≡ HOME ≡ DATA SUMMARIES ≡ DATA BROWSER ≡ TRAIT QUERIES ≡ ABOUT GENESYS

≡ Full extent ≡ Reset map ≡ Previous extent ≡ Google earth file ≡ Download map image

## CROP LIST

Banana  
Barley  
Beans  
Breadfruit  
Cassava  
Chickpea  
Coconut  
Cowpea  
Cultivated potato  
Faba bean  
Finger millet  
Grass pea  
Lentil  
Maize  
Pearl millet  
Pigeonpea  
Rice  
Sorghum  
Sweet potato  
Taro  
Wheat  
Yam

Accession Level



My Result Set

My Accessions

GIS MAPS

Need Help

## Latest News

Data is up-to-date  
GENESYS recently received  
full data updates from  
EURISCO, SINGER... [more](#)

GRIN Update  
All characterisation and  
evaluation data from GRIN  
has been succe... [more](#)

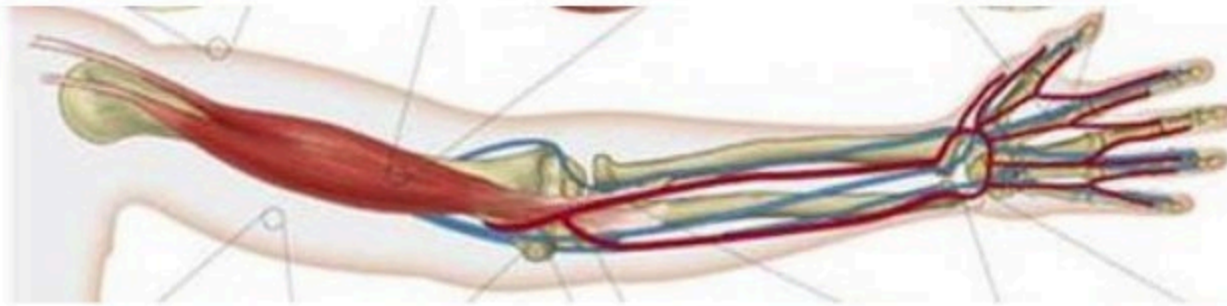
ICARDA Update  
All characterisation and  
evaluation data for five crops  
from ICAR... [more](#)

IITA Update  
IITA has successfully

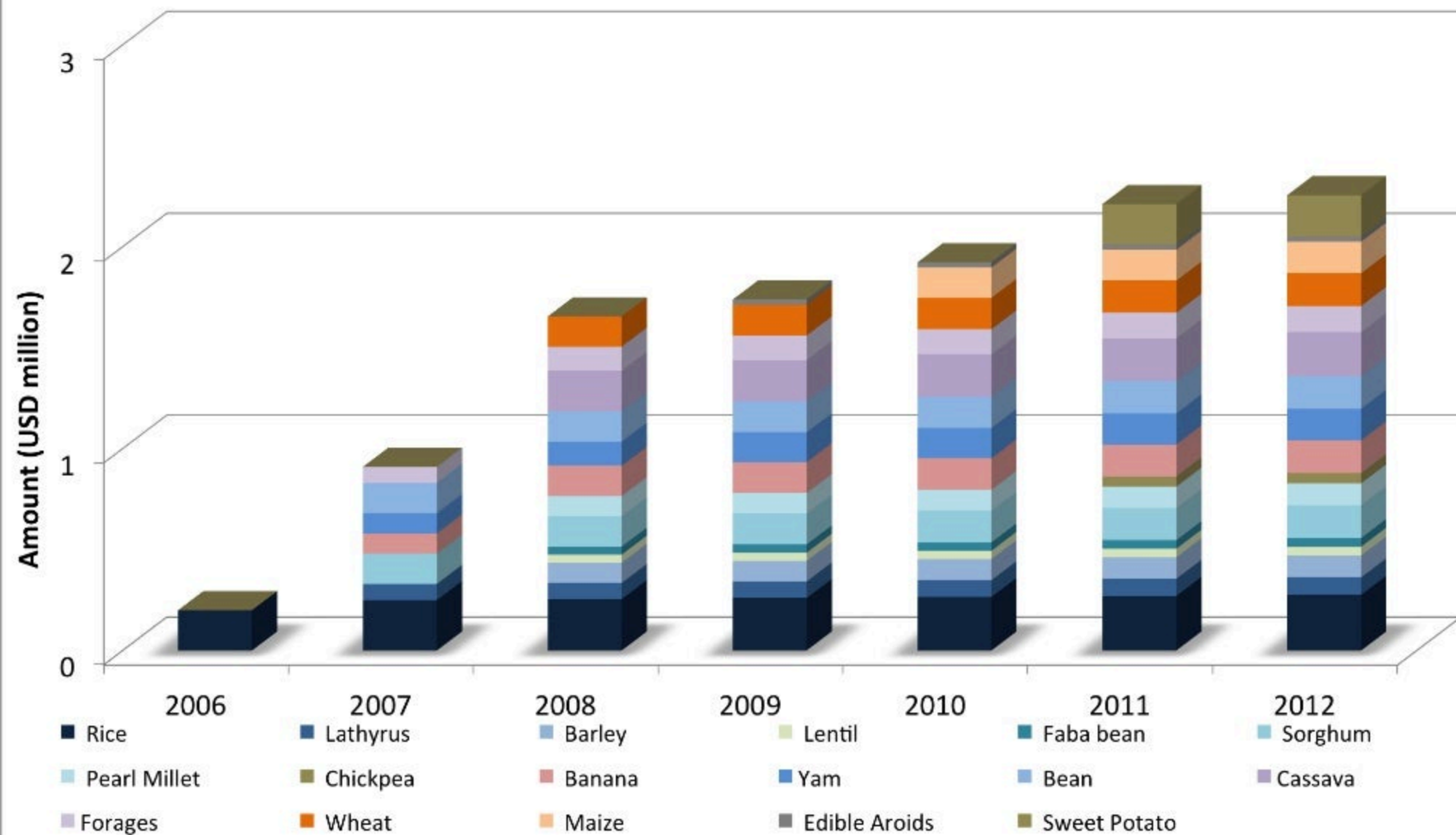


# “The Connective Tissue”

- Characterization of accessions
- Development and evaluation of use subsets
- Gap analysis
- Multiplication, disease-indexing, cleaning accessions
- Data management and provision
- Ex situ-in situ linkages
- Conservation research and automation



## Trust Long-Term Grants





# Transition to Sustainable Funding

INDICATIVE FUNDING REQUIREMENTS FOR GENE BANKS, AS TRUST ENDOWMENT GROWS

