# State of the World's Plant Genetic Resources for Food and Agriculture

**Colloque Biodiversité agricole et sécurité alimentaire**

**Vavilov retrouvé?**

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Toulouse, 17 Septembre 2013

Bioversity International

## Outline of the presentation

- Bioversity International and the CGIAR
- About PGRFA and SoW-2
- Key findings
- Drivers of erosion
- Information gaps

# Bioversity International and the CGIAR Consortium

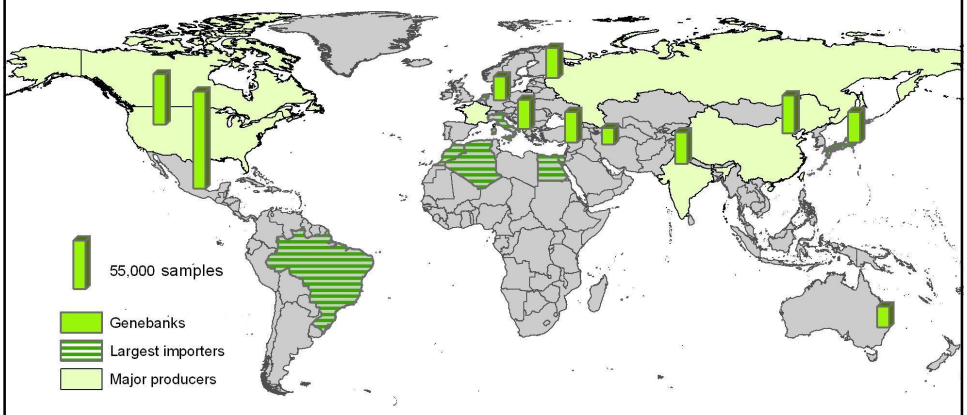
CGIAR
Science for a food secure future

Bioversity International

## PGRFA and food security

- Plant Genetic Resources for Food and Agriculture (PGRFA) : all plants used by humans and their wild relatives
- There are 30.000 edible plants species of which 700 are cultivated
- Plants account for more than 80 % of the human diet
- PGRFA is the raw material for fighting pests, adapting to climate change and more
- 50% of the food production is a direct result from crop improvement

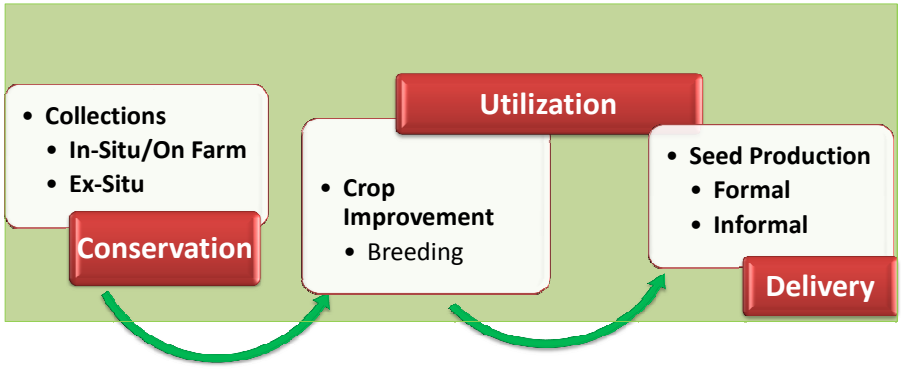
## Global PGRFA interdependency (Example: wheat)




THE SECOND REPORT OF THE STATE OF THE WORLD'S PLANT GENETIC RESOURCES FOR FOOD AND AGRICULTURE

## The PGRFA continuum

→ The PGRFA continuum encompasses three key components: **Conservation** of crop germplasm, **utilization/plant breeding** and the **seed sectors**



## The Second Report on SoW-PGRFA

- Preparation overseen by the Commission on Genetic Resources for Food and Agriculture (CGRFA)
- 1,200 stakeholders of 113 national agricultural services
- 5 Donors –Canada, Italy, Japan, Norway and Spain
- Bioversity International, 5 other CG- Centers, and GCDT

| 2nd SoW-PGRFA | |
|---|---|
| Region | Country Reports |
| Africa | 23 |
| Americas | 22 |
| Asia & Pacific | 19 |
| Europe | 30 |
| Near East | 17 |
| Total | 111 |

## KEY FINDINGS

## *Ex situ* conservation

- 1750 individual gene banks worldwide
- 7.4 million accessions, almost 90% held in National gbanks
- 1.4 million accessions added in the last 12 years of which 240,000 are new collections
- Less than 30% of germplasm conserved is unique
- About 700,000 accessions in CGIAR genebanks
- 45% of collections held in just 7 countries (12 in 1996)
- Brazil, China, India have more than doubled their collections in the last decade
- Global long term seed safety repository established in 2008

## *In situ* conservation and management

- A huge reservoir of PGRFA diversity is represented in nature and in farmer's fields., but for how long?
- Countries' ratification of the CBD and the International Treaty have led to an increased focus on conservation of cultivated plants and their wild relatives.
  - Protected Areas worldwide has increased by 30%,
  - Increase in CWR collecting, conservation and base broadening
  - Traditional cultivars and landraces are continuously subject to genetic erosion largely due to replacement by modern varieties
- Climate change poses a serious risk, especially to CWR survival: 16-22% of species of Vigna, Solanum, Arachis will disappear by 2055
- 105 countries have been warned about genetic erosion in key food security crops, e.g. minor cereals, fruits, nuts and vegetables

# Sustainable use of PGRFA

**Key issues:**

- The breeding is focused largely on major crops and yield gains
- Low use of germplasm by breeding programmes
- There is a decrease or no change in national capacities but increase of private sector role
- Biotechnology & informatics advance but are poorly integrated in national breeding programs

**Plant breeding needs a boost to increase use of diversity!**

- New capacities and funds are needed to reorient breeding programs
- Increase use diversity, develop crops to tackle climate, pests, malnutrition,

**Better utilization of broader diversity in production systems**

# Seed production and delivery

**Market oriented agriculture: formal seed systems**

- Huge growth of private sector with routine use of quality seeds of major species
- Increased seed trade and enabling environments

**Subsistence agriculture: informal seed systems**

- Important role of farmers
- Weak or no infrastructure with few improved varieties and insufficient quality seeds, markets
- Limited public, private sector role

## DRIVERS OF EROSION

- Variety Displacement
- Urban Pressures
- Climate Change
- Land degradation
- Over-exploitation
- Change in consumer choice

## GAPS IN INFORMATION

## PGRFA as ecosystem regulating and supporting services

PGRFA contributes a range of ecosystem services, including:

- Water regulation and purification,
- Climate regulation and pest/disease control,
- Soil formation and prevention of erosion,
- Nutrient cycling.

**This was discussed in the SOW-2 but <u>not quantified!</u>**

## Other information gaps:

- Degree of diversity and geographical distribution of local, adapted varieties
- Accurate and applicable methodologies for diversity evenness and richness estimation
- Reliable measures and baseline data for monitoring goods and services provided to maintain ecosystems healthy as well as for assessments for sustainability and food security
- Quantification of PGRFA trade offs for sustainable production systems
- Early warning mechanisms in place to provide adequate responses to threats

# Thank you!

Bioversity International

Thank you to FAO for providing the basis of this presentation