



Food and Agriculture  
Organization of the  
United Nations

COMMISSION ON  
GENETIC RESOURCES  
FOR FOOD AND  
AGRICULTURE

# Key ecosystem services for food and agriculture

## The State of the World's genetic resources






Irene Hoffmann  
Secretary

Commission on Genetic Resources for Food and Agriculture

8<sup>th</sup> Trondheim Conference on Biodiversity: Food systems for a sustainable future  
*Trondheim, Norway, 31 May-3 June 2016*

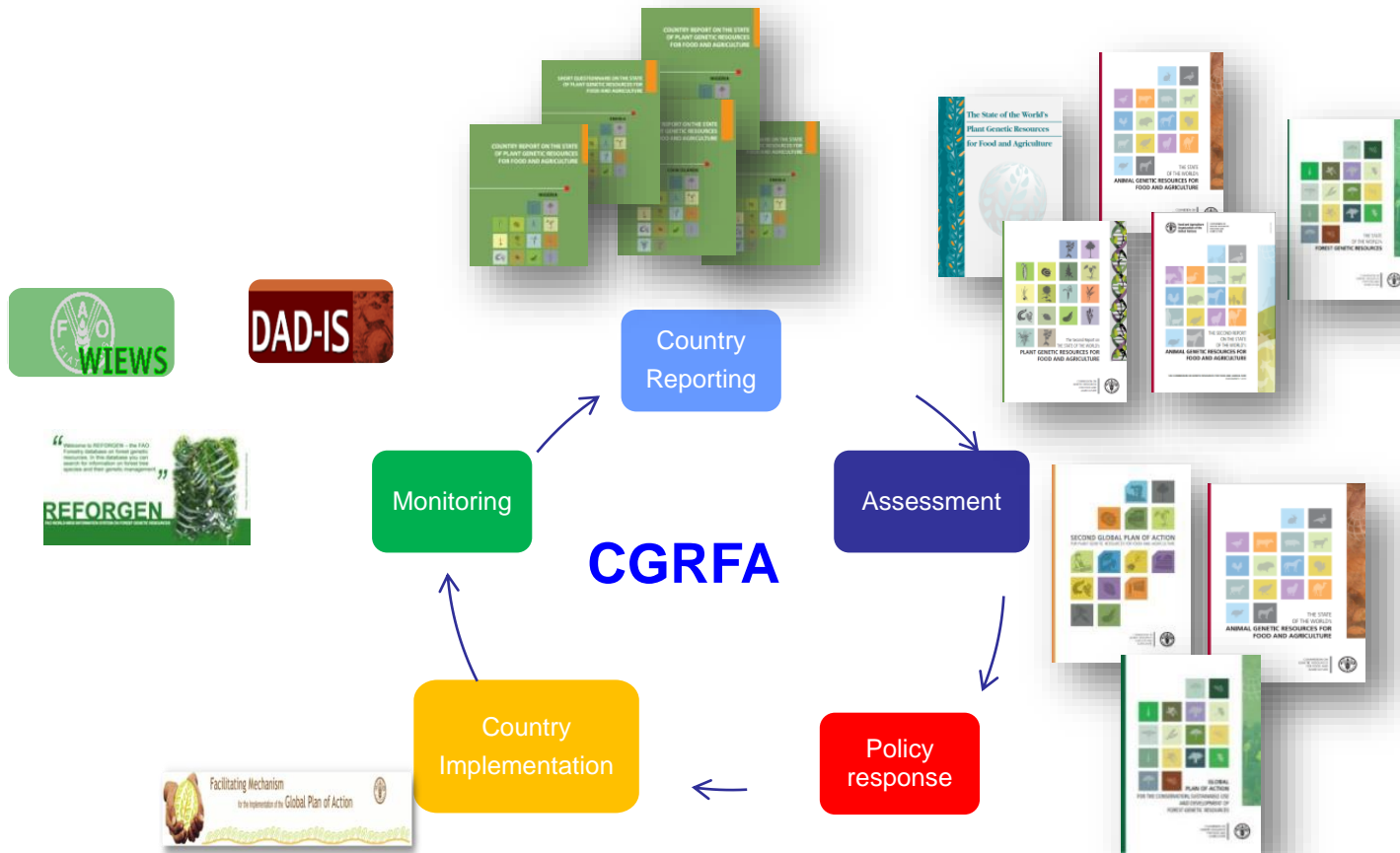


# The Commission on Genetic Resources for Food and Agriculture

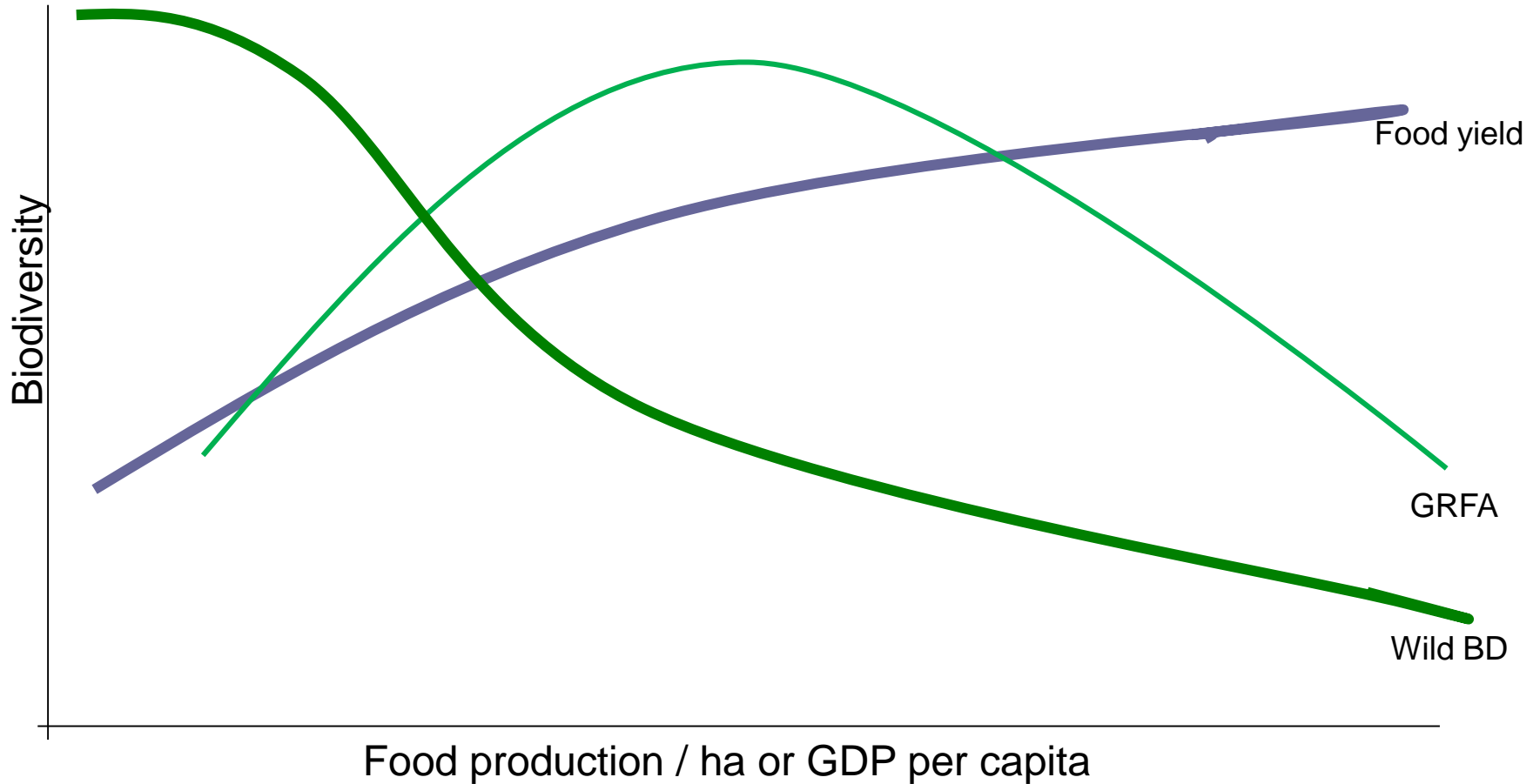
-  1983 Established to deal with plant genetic resources
-  1995 Mandate broadened to cover all components of biodiversity for food and agriculture
-  2000 Close collaboration with CBD, as reflected by CBD PoW on Agricultural Biodiversity
-  2007 MYPOW, incl. vision and mission
-  2016 178 member countries + EU



# The Commission's cycle of work



# Biodiversity in human economic development



# GRFA diversity



**7000 plant species** used as food in the world

150 species have commercial importance, of which **103 species** represent **90% of the food production**

**3 species** (wheat, rice and maize) represent **56% of Kcal** consumed

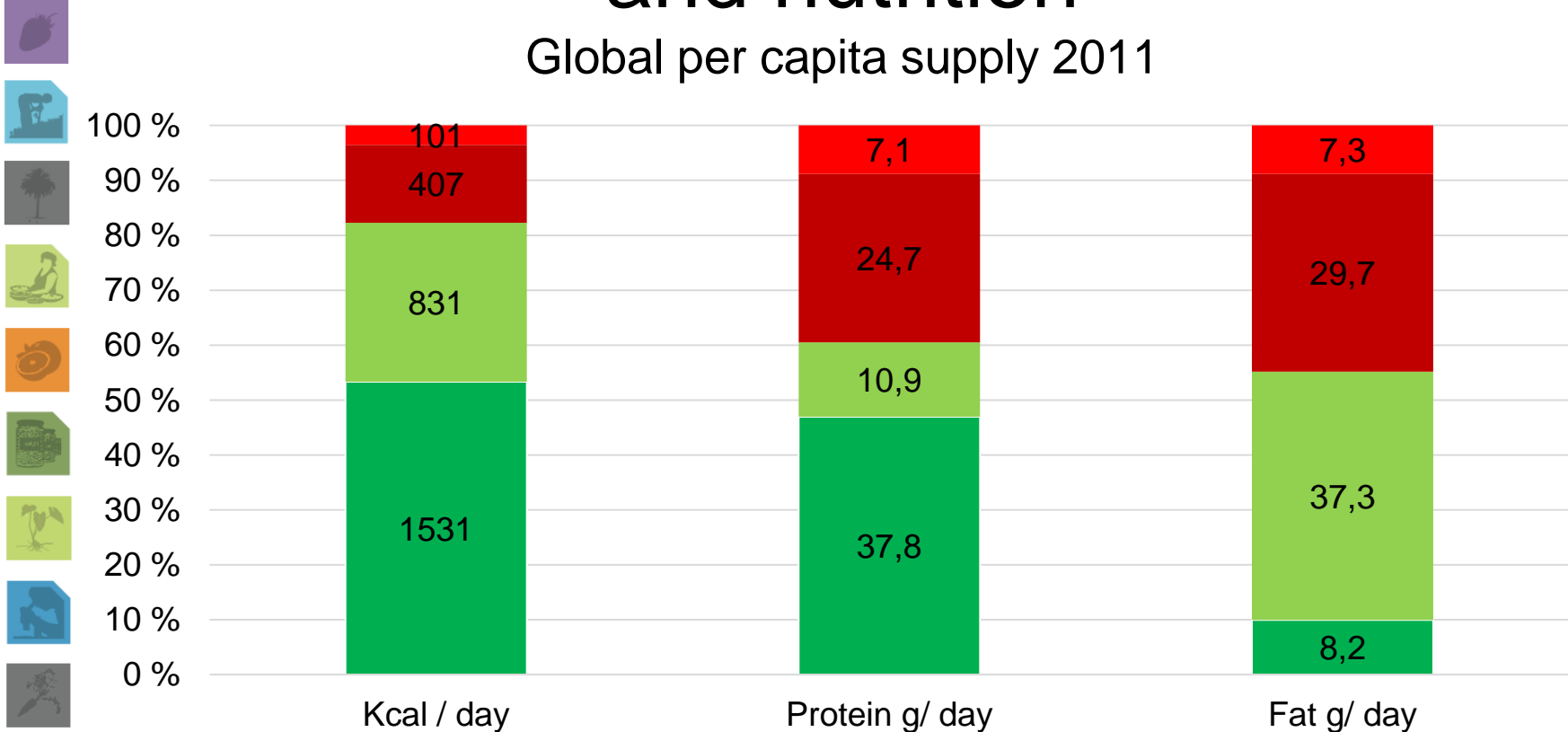
**about 40 animal species** used as food

**8700 breeds**

**5 species** (cattle, sheep, goats, pig, chicken) represent **87% of the animal food** consumed

# GRFA contribution to food security and nutrition

Global per capita supply 2011



- other animal
- 5 species (Bovine, small ruminant, pig and poultry meat, milk and eggs)
- other vegetal
- 8 crops (barley, beans, groundnut, maize, potatoes, rice, sorghum, wheat)

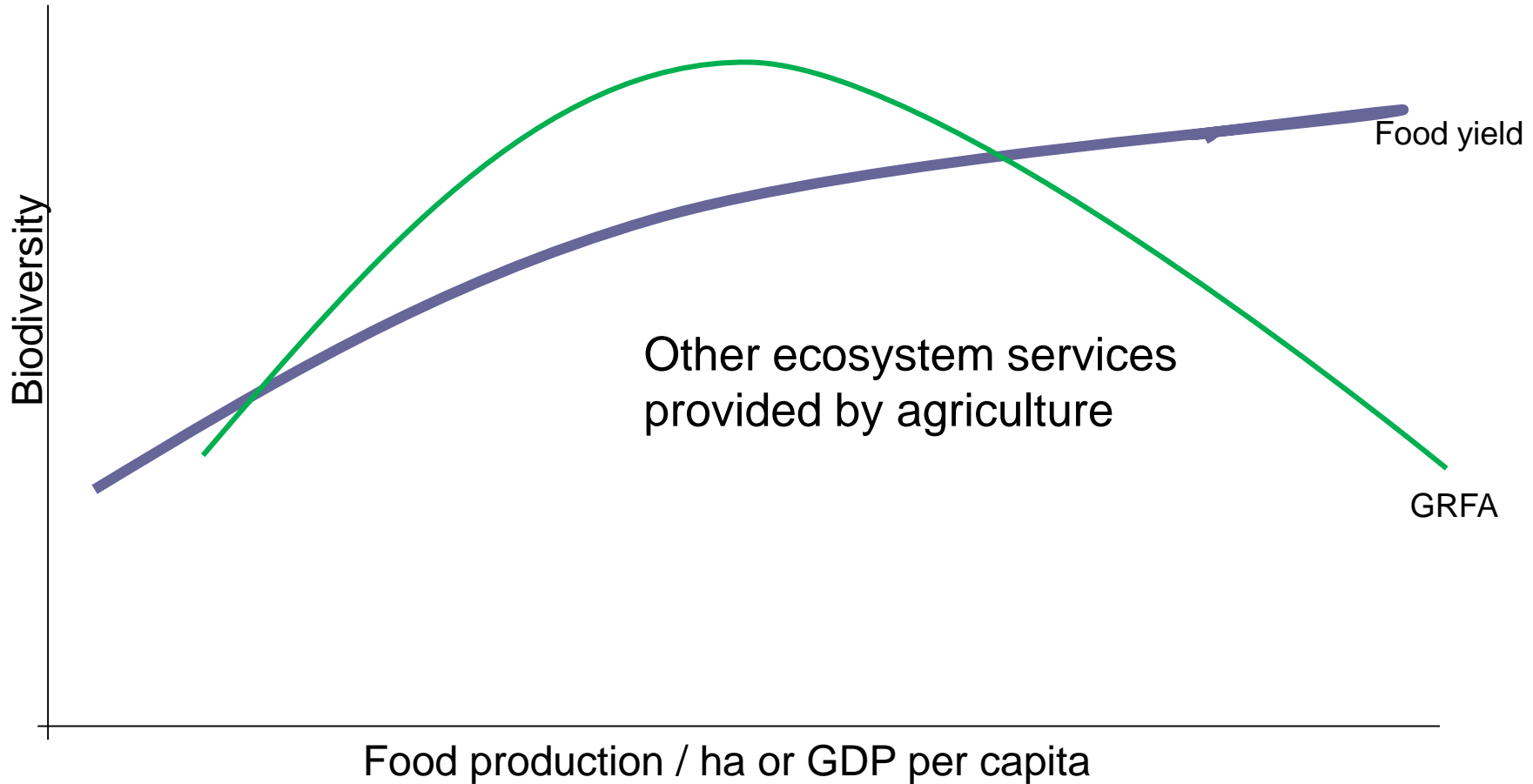
FAO Food balance sheets



**Food and Agriculture Organization of the United Nations**

COMMISSION ON GENETIC RESOURCES FOR FOOD AND AGRICULTURE

# Biodiversity in human economic development



Food and Agriculture  
Organization of the  
United Nations

COMMISSION ON  
GENETIC RESOURCES  
FOR FOOD AND  
AGRICULTURE

# Drivers of GRFA loss

Demand for crop / livestock products		Climate change	
Marketing infrastructure and access		Changes to grazing land & other natural resources	
Retailing		Disease	
Imports of crop / animal products		Economic, livelihood and lifestyle factors	
Exports of crop / animal products		Replacement of crop / livestock functions	
Policy factors		Technology ????	

## Magnitude of impact

	High
	Moderate
	Low

## Predicted trends in impact

	Increasing impact
	Continuing impact

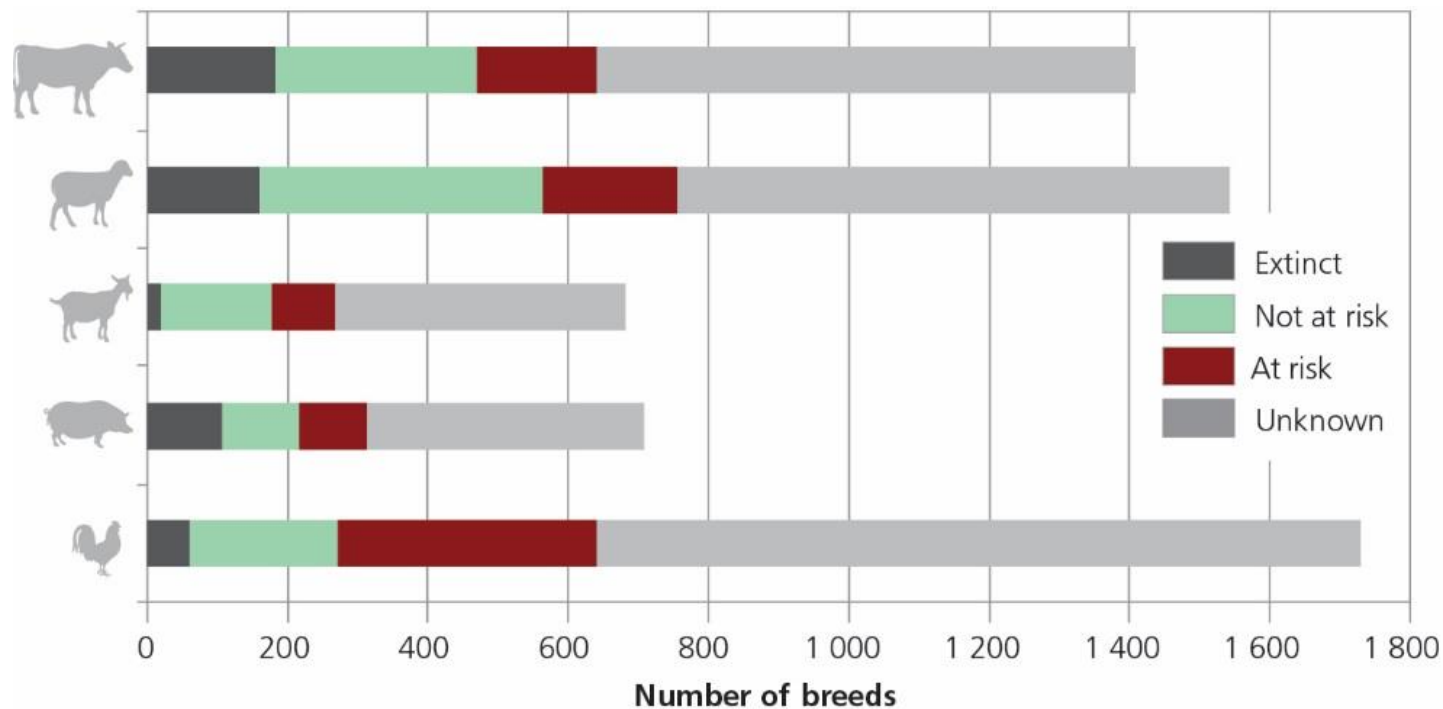


Food and Agriculture  
Organization of the  
United Nations

COMMISSION ON  
GENETIC RESOURCES  
FOR FOOD AND  
AGRICULTURE



# Status of the world's livestock breeds



- Livestock breeds classified as being at risk of extinction increased from 15 percent to 17 percent between 2005 and 2014.
- 58 percent of breeds are classified as being of unknown risk status.



# Status of PGR

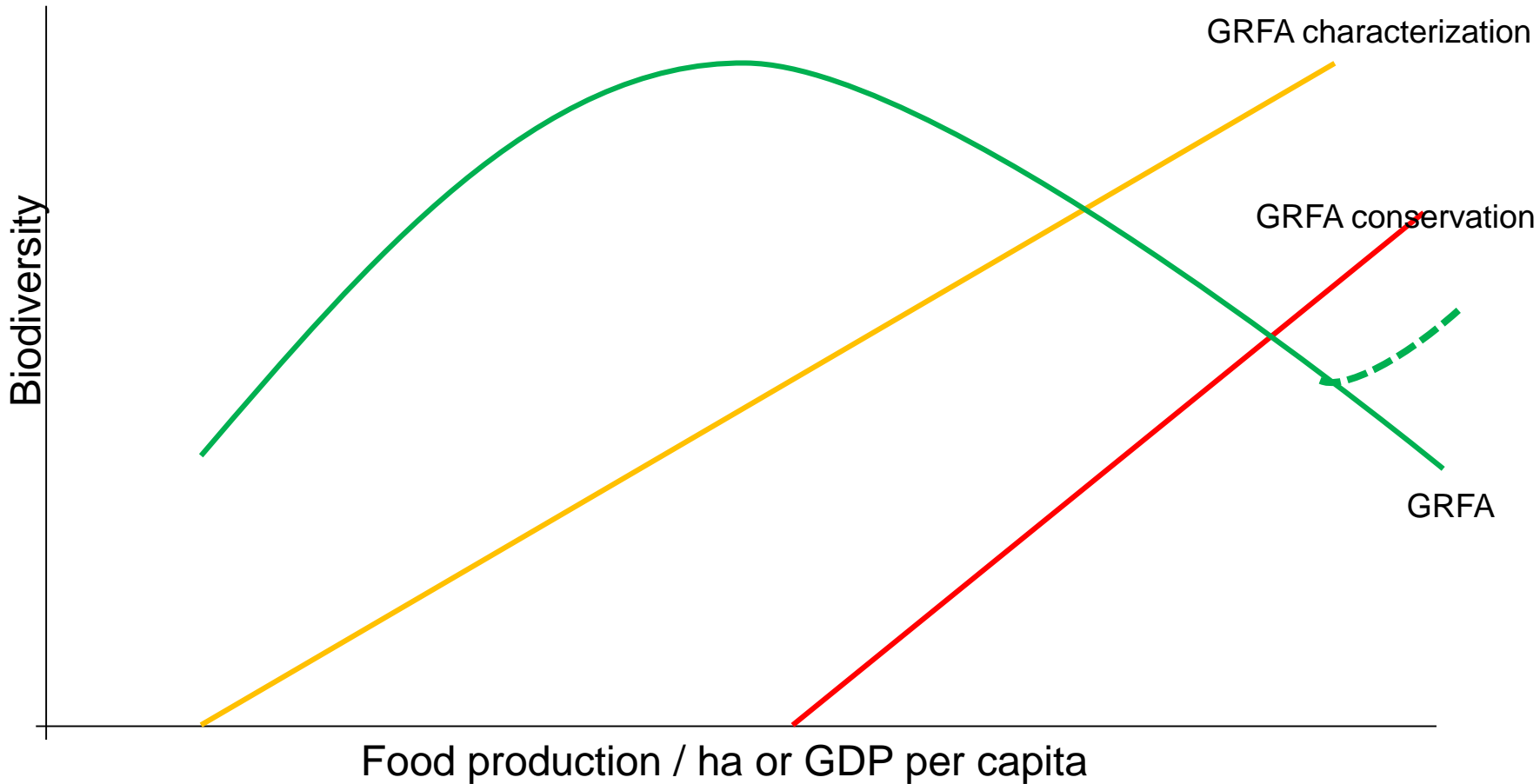


# Monitoring implementation of the Global Plans of Action

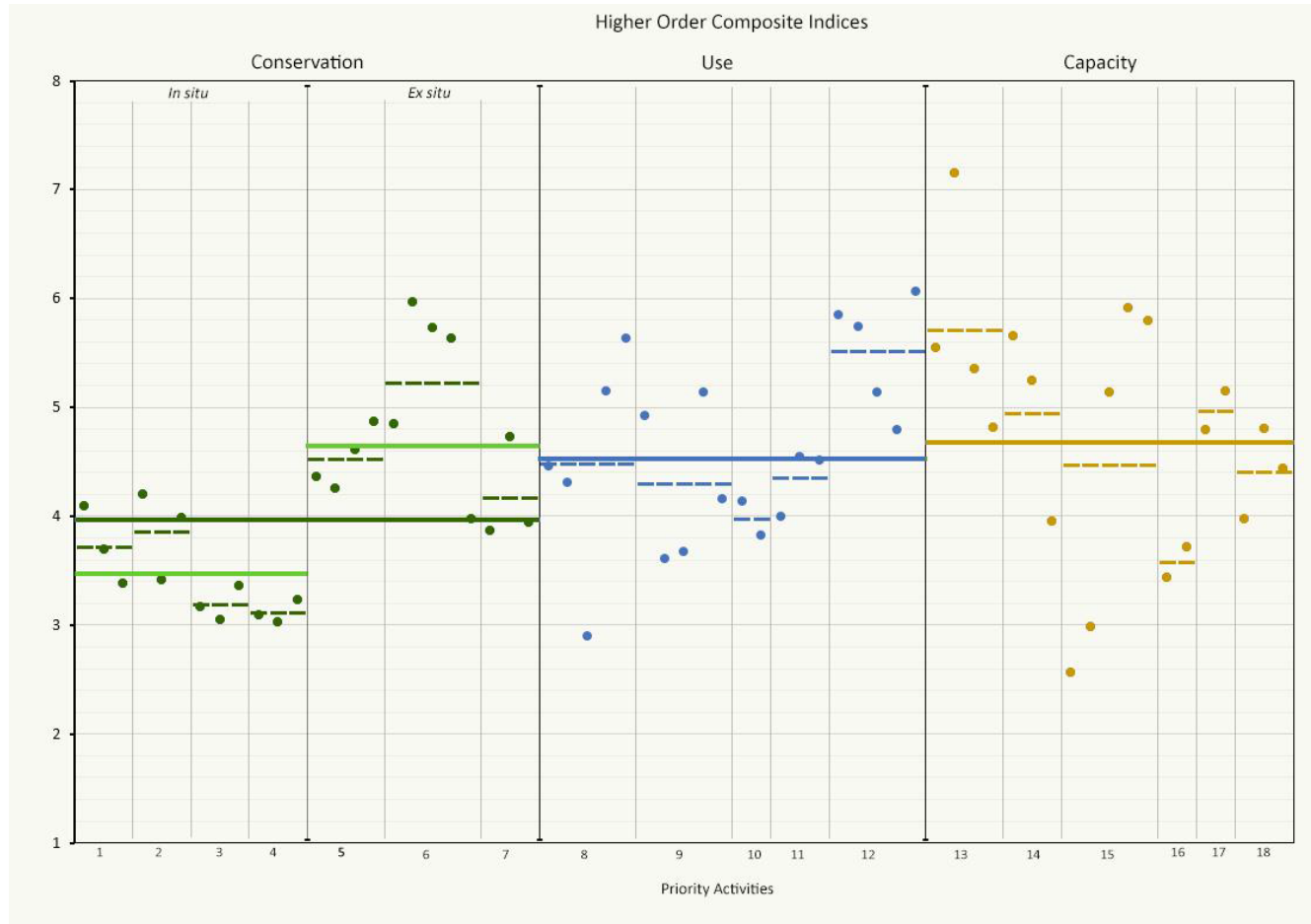
Characterization, surveying, monitoring  
Sustainable use and development  
Conservation  
Policies, institutions, capacities,



# Biodiversity in human economic development



# Higher Composite Indices - Achievements in the 2<sup>nd</sup> GPA-PGR



# Indicators for strategic priority areas – Achievement in the GPA-AnGR, 2014

Region	Charact. Use	Cons.	Policy	Collaboration	Funding
Africa	0.69	0.66	0.48	0.74	0.39
Asia	1.01	0.94	0.81	0.99	0.36
Europe and the Caucasus	1.48	1.31	1.29	1.43	1.03
Latin America and the Caribbean	0.89	0.90	0.77	0.91	0.33
Near and Middle East	0.57	0.33	0.22	0.35	0.25
North America	1.92	1.87	2.00	1.69	1.13
Southwest Pacific	0.57	0.37	0.25	0.23	0.11
World	0.98	0.89	0.78	0.95	0.54

Note: Indicator scores are divided into eight evenly distributed classes between a minimum score of 0 and a maximum score of 2.

A score of 2 means that all actions covered by the indicator have been implemented fully. A score of 0 means that no action has been taken. Indicator scores:

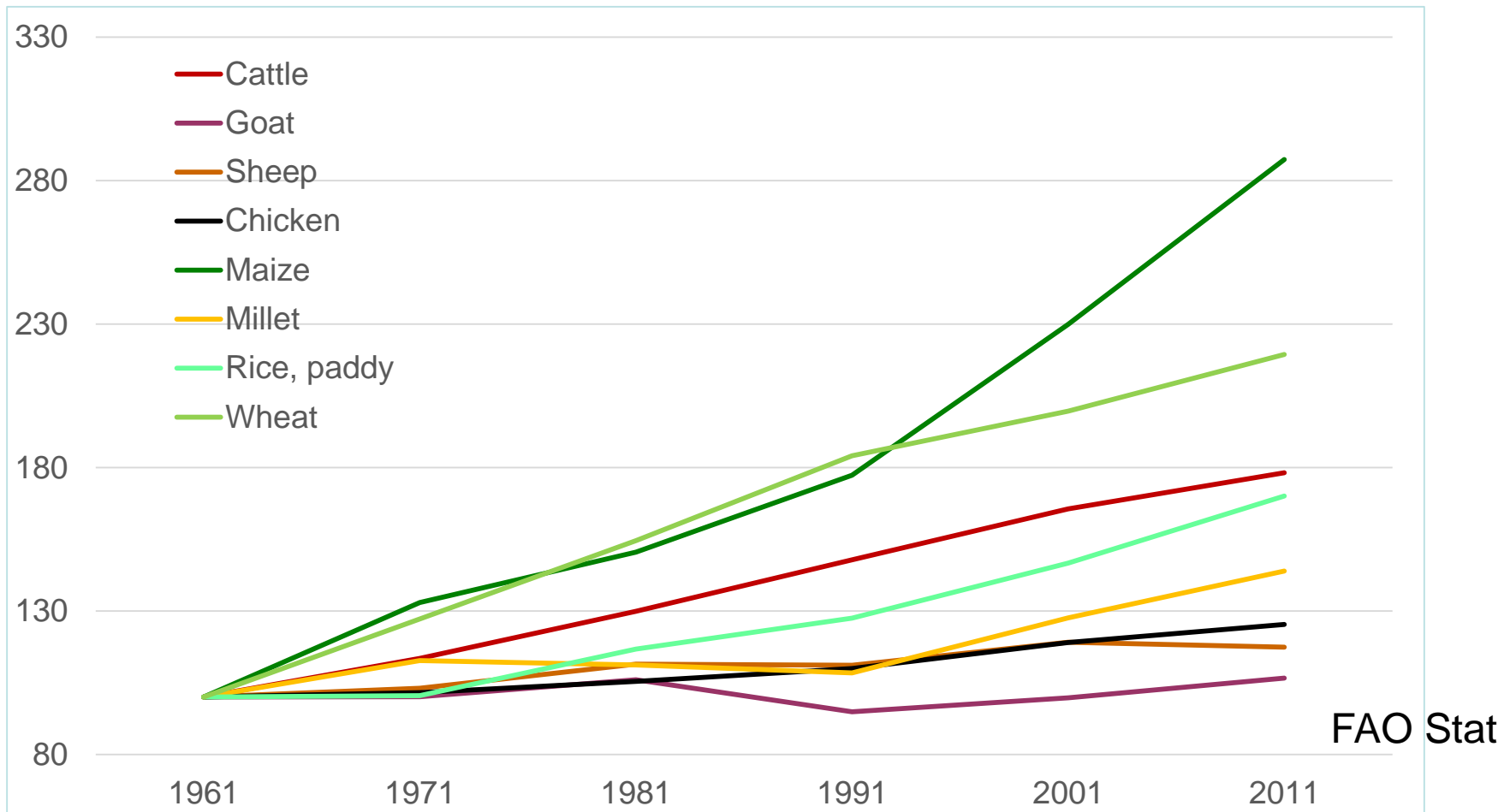


Food and Agriculture  
Organization of the  
United Nations

COMMISSION ON  
GENETIC RESOURCES  
FOR FOOD AND  
AGRICULTURE

# World yield increases

Yield per ha or per animal (all products), 1961=100



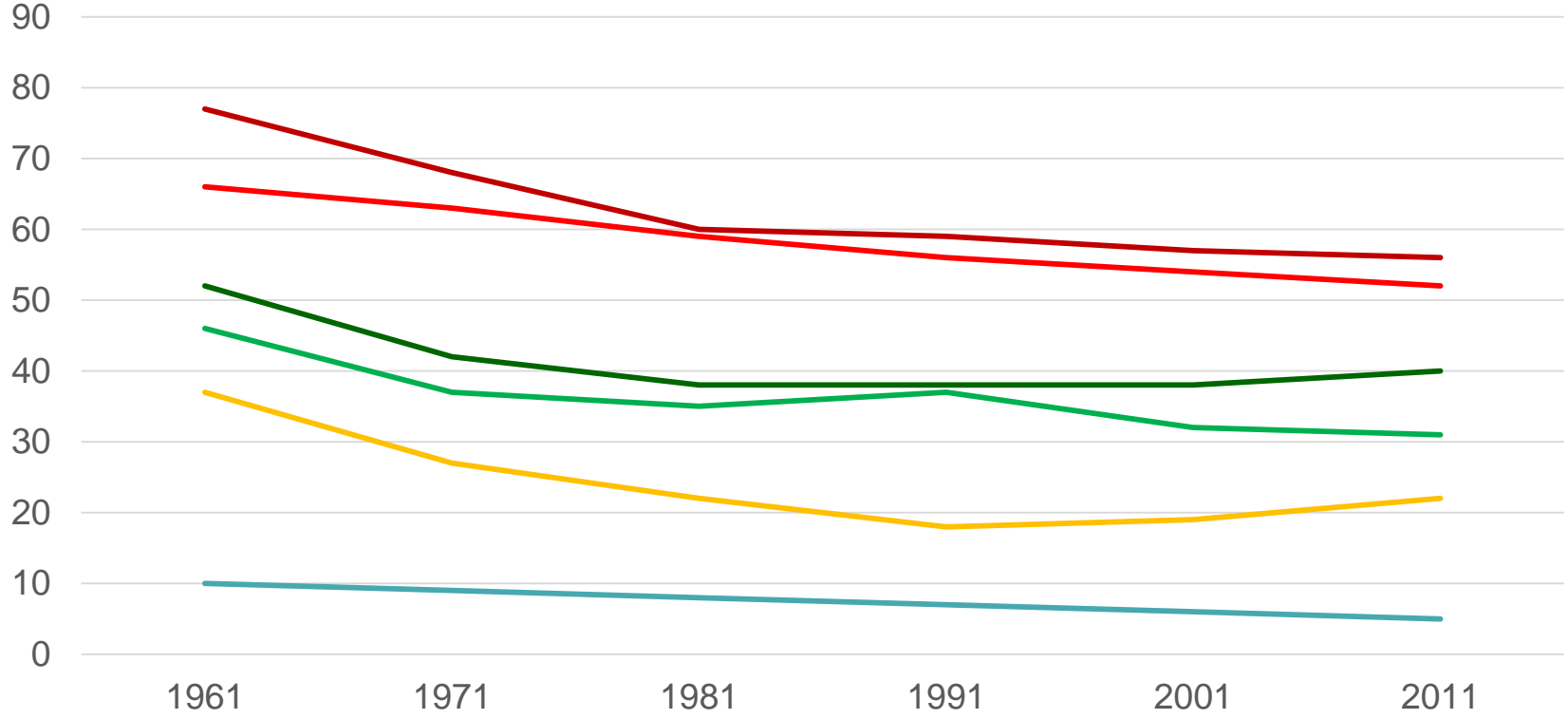
FAO Stat



Food and Agriculture  
Organization of the  
United Nations

COMMISSION ON  
GENETIC RESOURCES  
FOR FOOD AND  
AGRICULTURE

# LDC yields as percent of EU yield levels



8 animal species  
5 animal species

15 crops yield/ha  
Maize yield/ha

9 crops  
Cow milk

FAO Stat

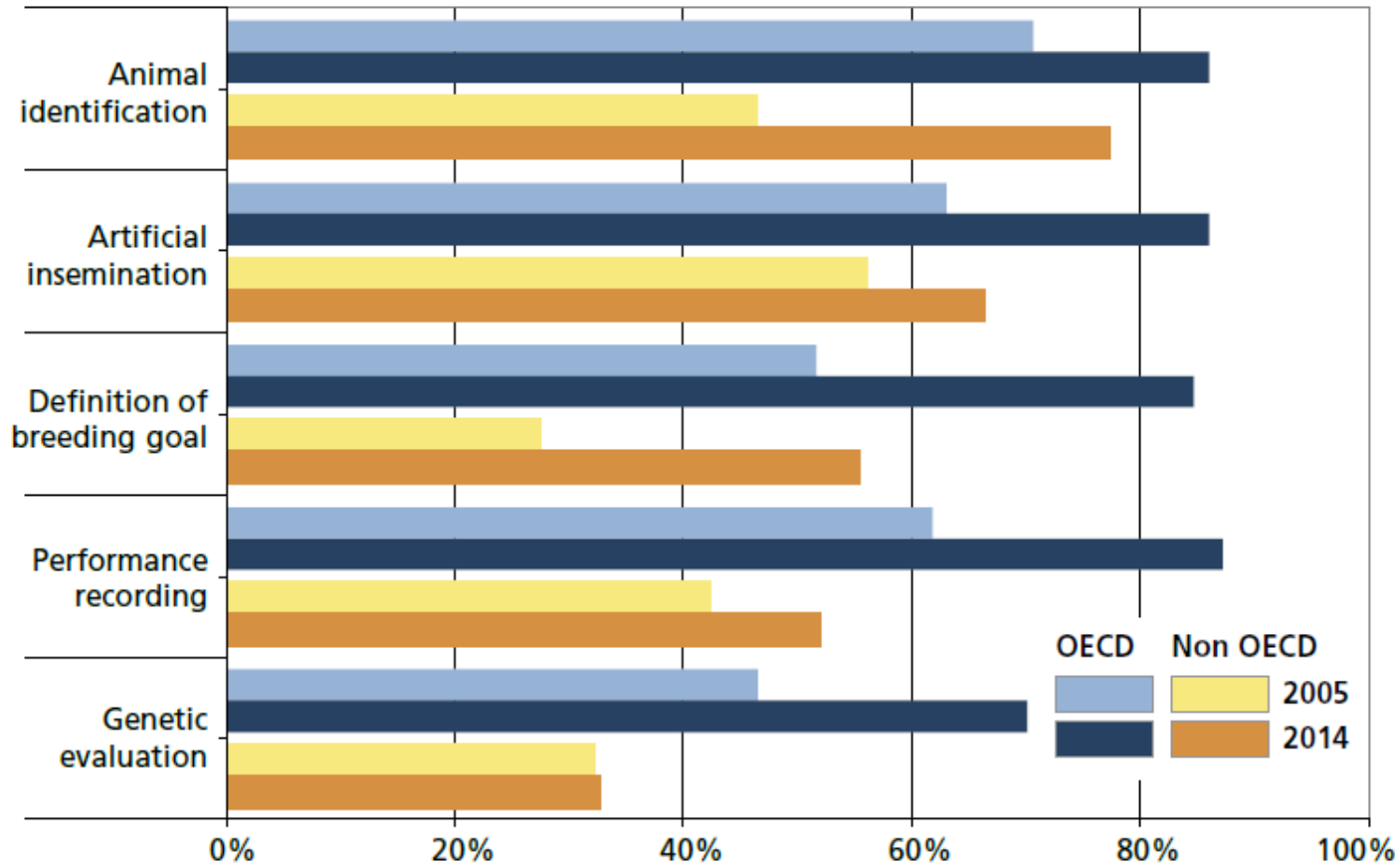


Food and Agriculture  
Organization of the  
United Nations

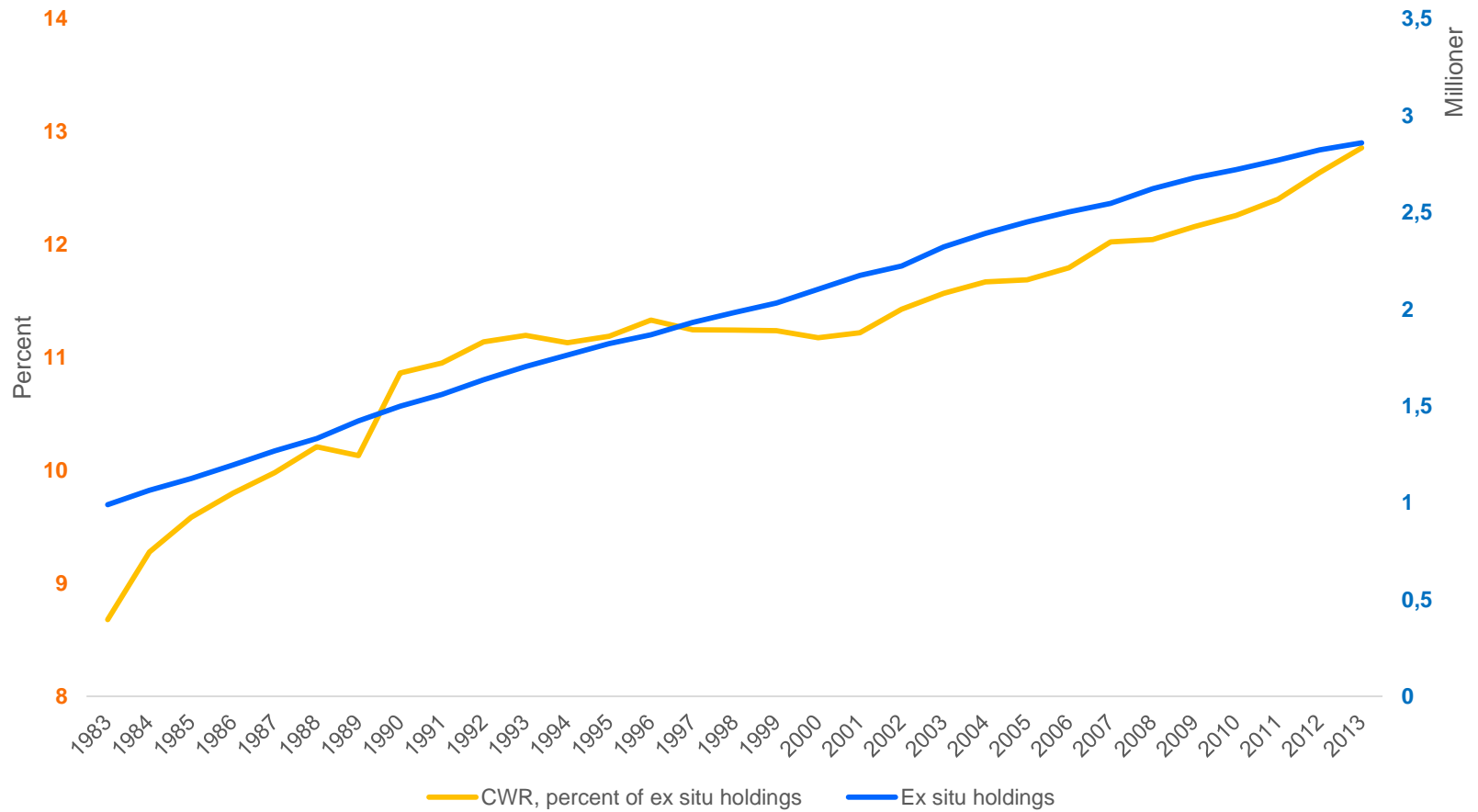
COMMISSION ON  
GENETIC RESOURCES  
FOR FOOD AND  
AGRICULTURE



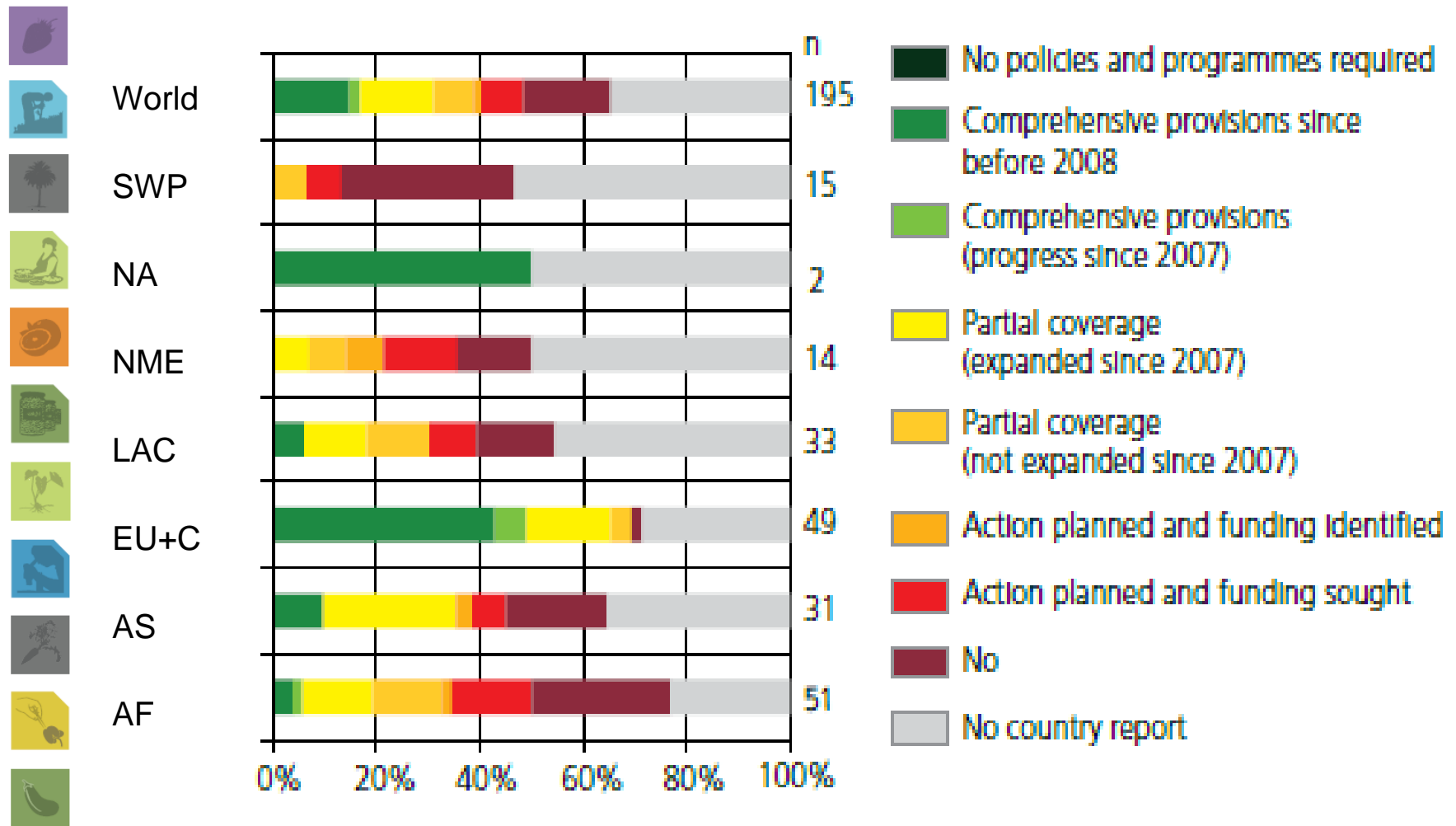
# Progress in the implementation of breeding tools in cattle



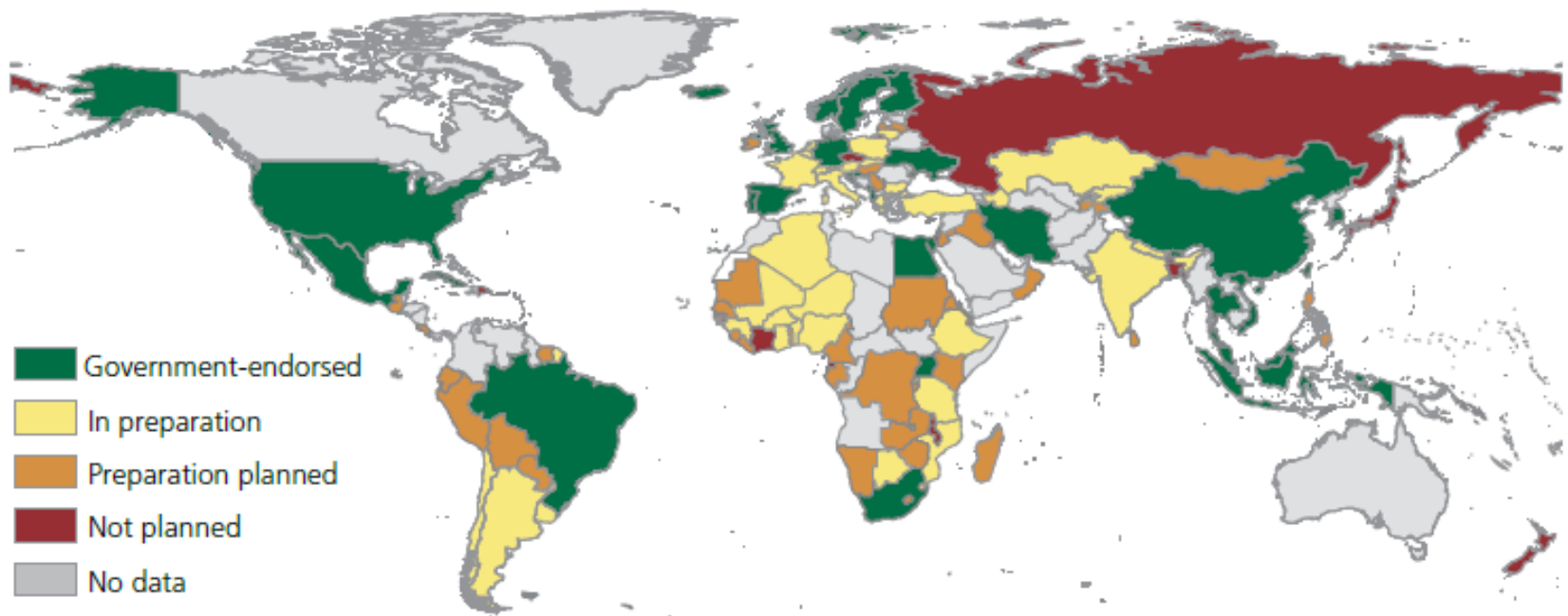
# Dynamic of total medium/long-term holdings conserved *ex situ* and CWR incidence since the establishment of the CGRFA in 1983



# State of AnGR conservation programmes and policies at country level (progress since 2007)



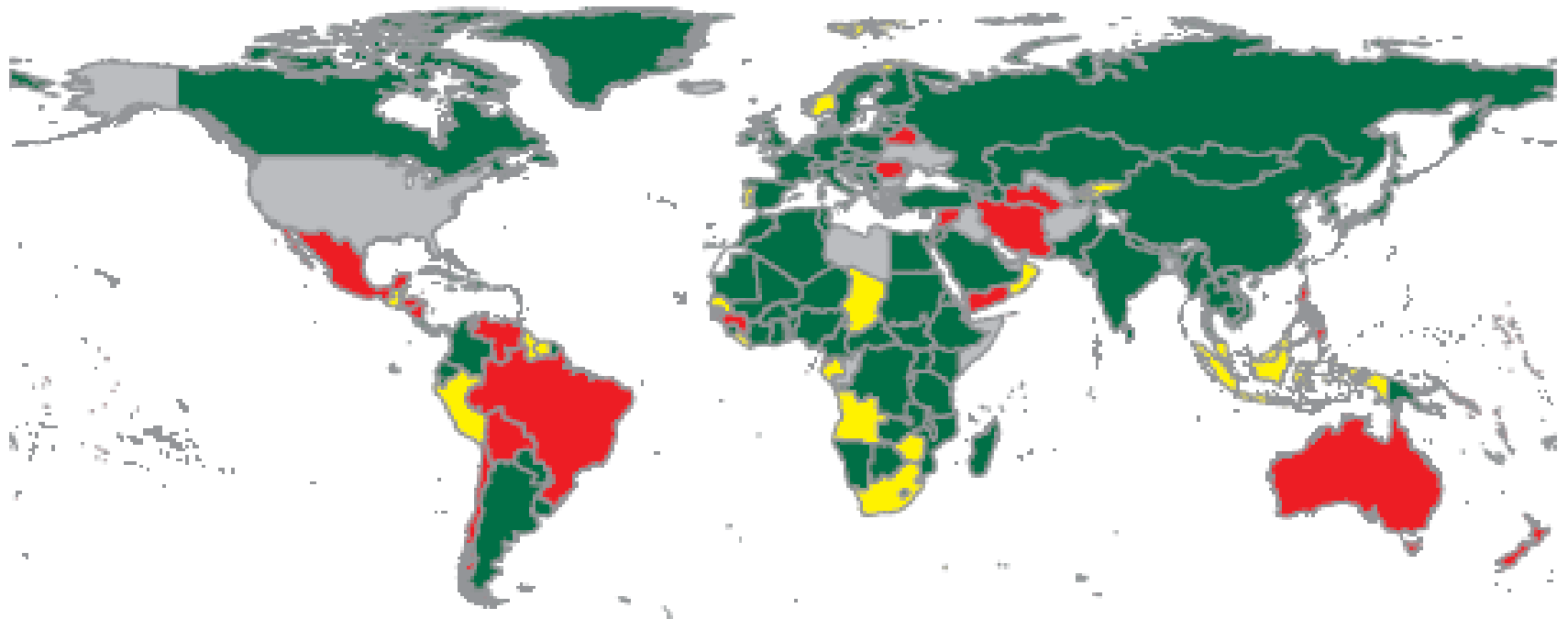
# Status of national strategy and action plans for animal genetic resources (2014)



- Government-endorsed
- In preparation
- Preparation planned
- Not planned
- No data



# Inclusion of animal genetic resources issues in national biodiversity strategies and action plans (2014)



AnGR-focused actions mentioned
  No mention of AnGR

Scope explicitly includes AnGR, but no AnGR-focused actions mentioned
  No NBSAP available



Food and Agriculture  
Organization of the  
United Nations

COMMISSION ON  
GENETIC RESOURCES  
FOR FOOD AND  
AGRICULTURE

# Ongoing global assessments: Biodiversity for food and agriculture

- Variety and variability of micro-organisms, plants and animals at the genetic, species and ecosystem levels that sustain the functions, structure and processes of the agro-ecosystem
- Ecosystem services framework
- Plant, animal, aquatic and forest production systems



# Conclusions

- The range of GRFA declines with production intensification as selected GRFA provide higher shares of total production of the respective commodity
- Commercial breeding continues to concentrate
- Smallholders remain the custodians of GRFA diversity
- GRFA loss continues on farm
- GRFA ex situ conservation increases
- Developments in biotechnologies offer opportunities for breeding and conservation programmes for locally important GRFA



# Policy conclusions

- Drivers of BD loss are similar in wild and GRFA and may be addressed jointly – collaboration between MoA and MoE
- Externalities of intensive production need to be internalized
- Smallholders need support to continue their diverse GRFA, production systems and heterogenous landscapes
  - Local control, choice and empowerment
  - Incentives for ecosystem services, incl. conservation
  - Rural development, land tenure, access to services and technology
- Partner with breeding industry for conservation beyond their crops/breeds





# Thank you



Food and Agriculture  
Organization of the  
United Nations

COMMISSION ON  
GENETIC RESOURCES  
FOR FOOD AND  
AGRICULTURE