

# **Science and Technology for and by the Developing World**

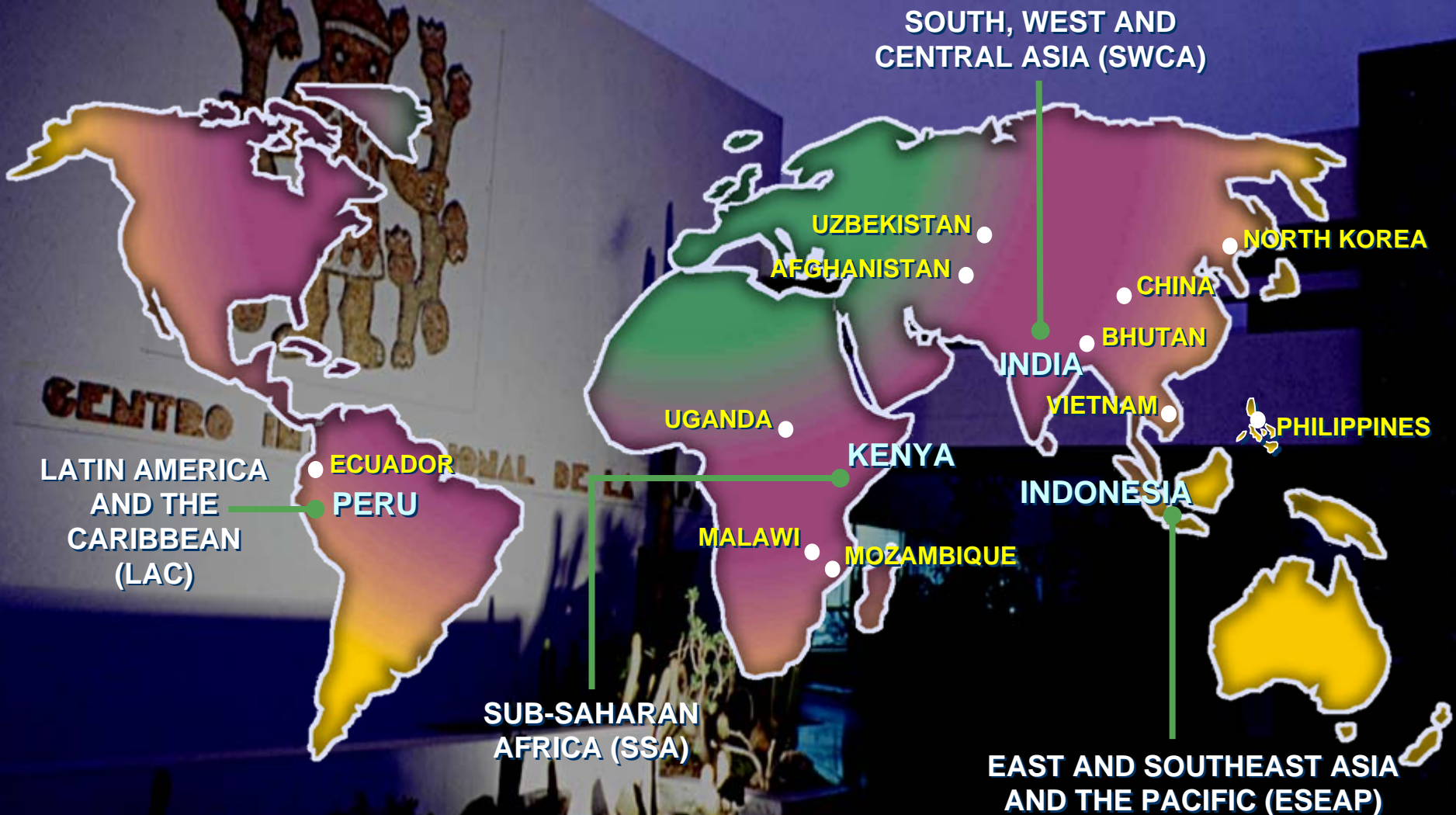
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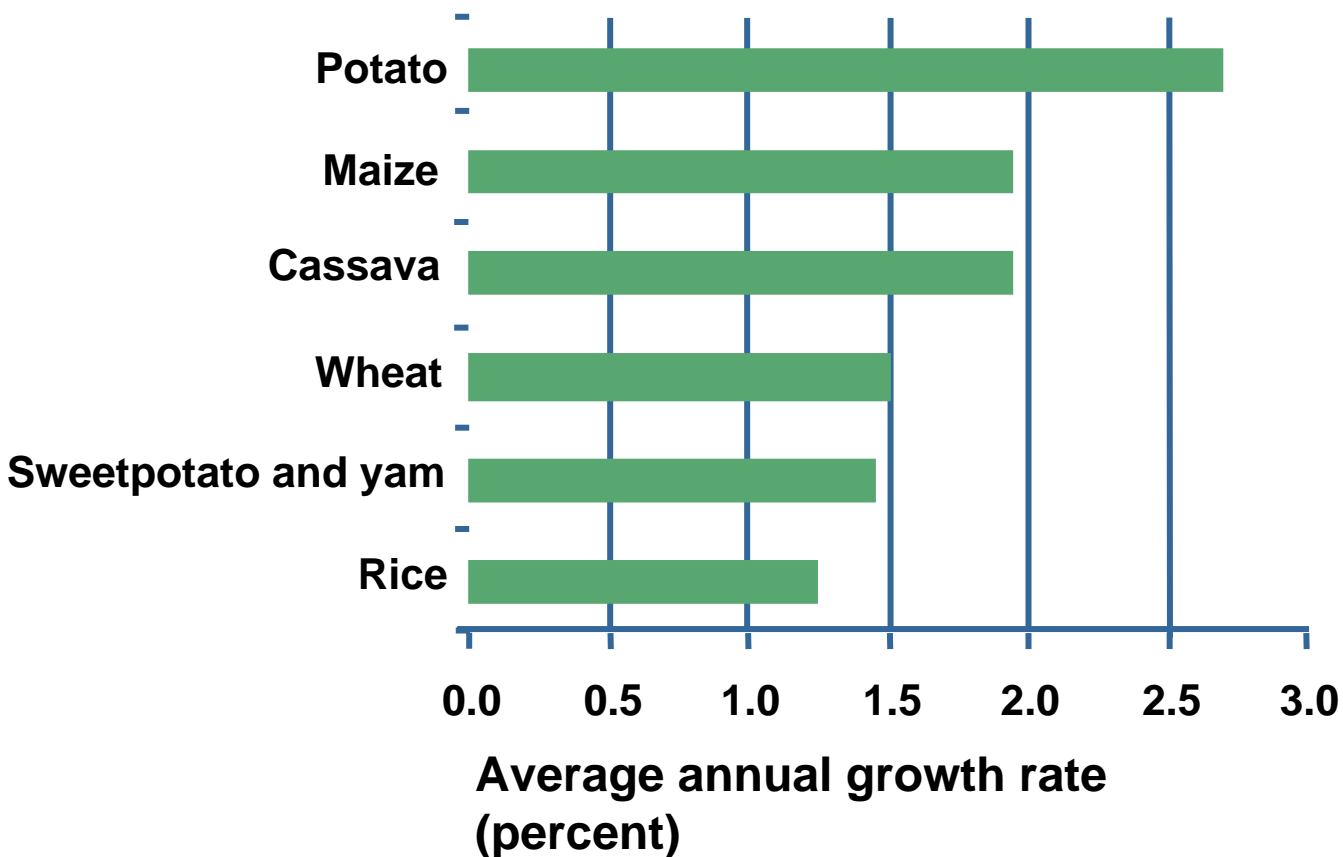








# Major developing-country food crops, 1993-2020

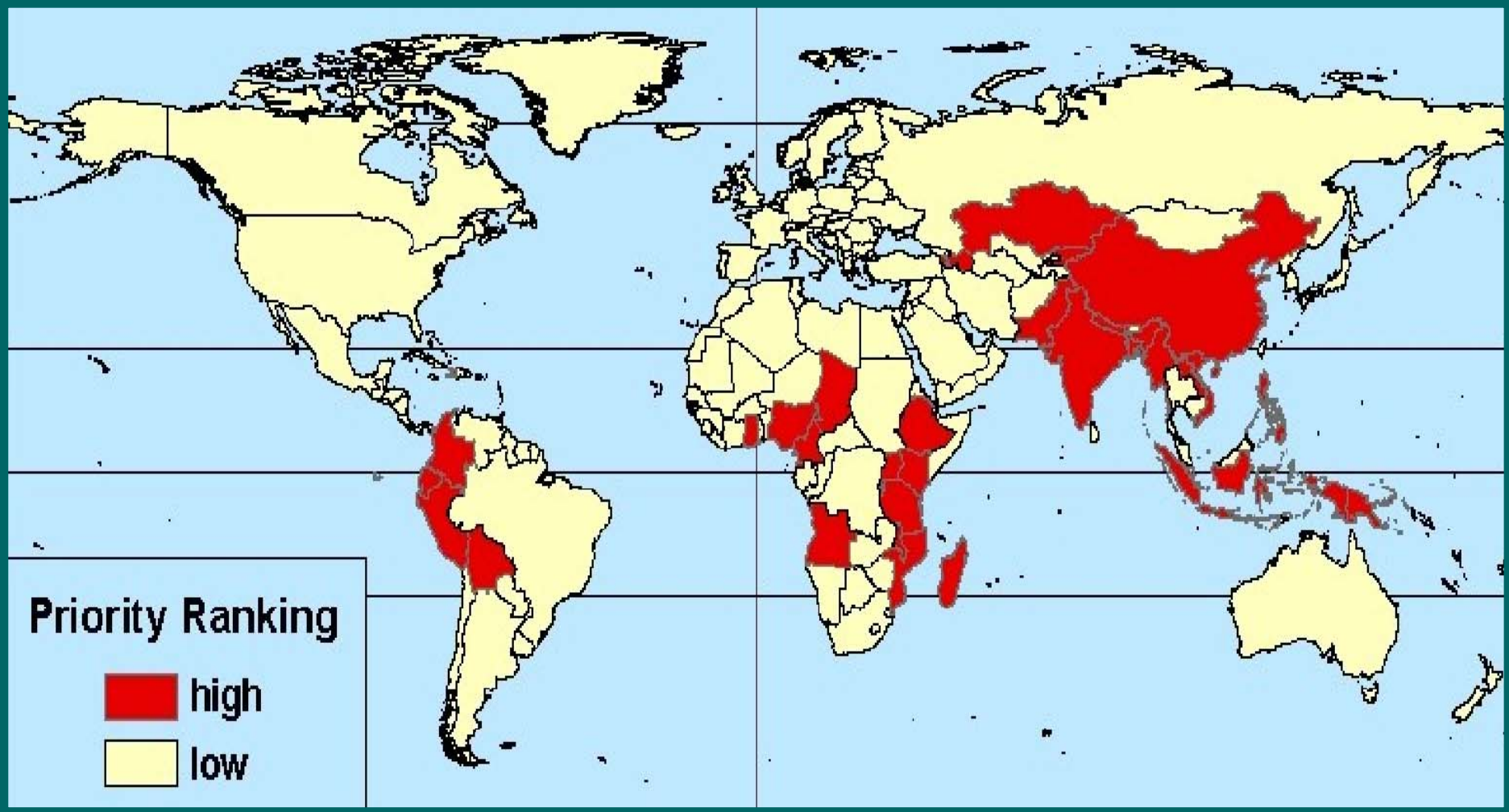




# CIP and the MDTs by 2015...

- halving the proportion of the population in extreme **poverty**
- halving the proportion of people who suffer from **hunger**
- reducing by two-thirds **the under-five mortality** rate
- reducing by three-quarters the **maternal mortality** ratio

# Development Target Areas













# Needs-driven technology

## The needs

- ensure food security through crop productivity
- balance nutritive value of crop plants
- offer higher income from farming
- protect the environment



















# Crop nutritional value

- vitamin A deficiency
  - 0.5 million children go blind each year
  - threatens 250 million
- lysine deficiency in cereals
- glycoalkaloid-related disorders in the Andes
- cyanide intoxication from poor cassava processing
- mineral deficiencies
  - weaken pregnant women, young children
  - threaten 2 billion people



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Table 1. 1992



# Genomics for CIP's research

## Potato

- characterization of plants and pests
- late blight, insect, virus resistances
- nutritional value

## Sweetpotato

- weevil and virus resistances
- drought and salt tolerance
- nutritional value & high starch recovery

# CIP approach to genomics

- technology access
- better gene prospecting
- candidate genes across plant family
- linkages through global programs - IARCs, LDCs, industrialized countries



# CIP's guiding principles

- use GE when other techniques not effective
- develop GE products appropriate for resource-poor farmers
  - minimum proprietary restrictions and technology-associated costs
  - easily transferred and managed
- conduct participatory and transparent GE research

# CIP's guiding principles

- give priority to genes occurring naturally in related species
- work with national partners to address risks and ensure confidence
- comply with national or regional regulations
- not deploy GE organisms in any country lacking such regulations



# Desired scenario

- free exchange of germplasm for research
- fair benefits sharing
- recognition of traditional germplasm-related values and knowledge
- wide access to genomics data bases
- empowerment of farmers to manage technology and access markets

# Genomics in the Third World

## Limitations

- insufficient academic training
- under-equipped laboratories
- limited IPR capacity
- weak data processing capabilities
- lack of Biosafety regulations/infrastructure
- vulnerability of centers of bio-diversity
- scarcity of information
- threatened access to genetic resources



# Two worlds of technology

## Industry-bound

- appropriable benefits
- input-linked
- non-renewable
- dependency-creating
- non-transparent
- centralized decision-making

## Farmer-enabling

- farm-level and community benefits
- knowledge-based
- maintained on-farm
- improvable by farmers
- independently applicable

# Capacity Building

- Acquire know-how to define issues and related technological answers
- Prepare policy frameworks for new technologies
- Understand pathways to farmer empowerment



<http://www.sciencecouncil.cgiar.org/publications/>

From its beginning, PROINPA established a policy of hiring and training young professionals. Forty nine members of staff received training from one or more of the CGIAR Centers in a diversity of areas during the period 1989-2004.

The generation of scientific information has increased and evolved. Output of scientific publications tripled between 1992 and 2002.

# Individual training by CIP to PROINPA staff (1990-2004)

Theme	Participants
Breeding	1
Biotechnology	4
Genetic Resources	1
Crop Protection	3
Information/Documentation	1
Participatory Research	1
Impact Assessment	1
<b>Total</b>	<b>12</b>

# Trends of PROINPA's publications and authorship

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	Number of Publications				
	PROINPA + CIP				
	Author's institution:		Senior author:		Total
	PROINPA	CIP	PROINPA	CIP	
1991-92	2	-	-	-	2
1993	-	5	9	5	19
1998-01	71	-	6	8	85
2002-03	29	-	27	3	59

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