



Achim Dobermann

**Deputy Director General
for Research**

**International Rice
Research Institute**

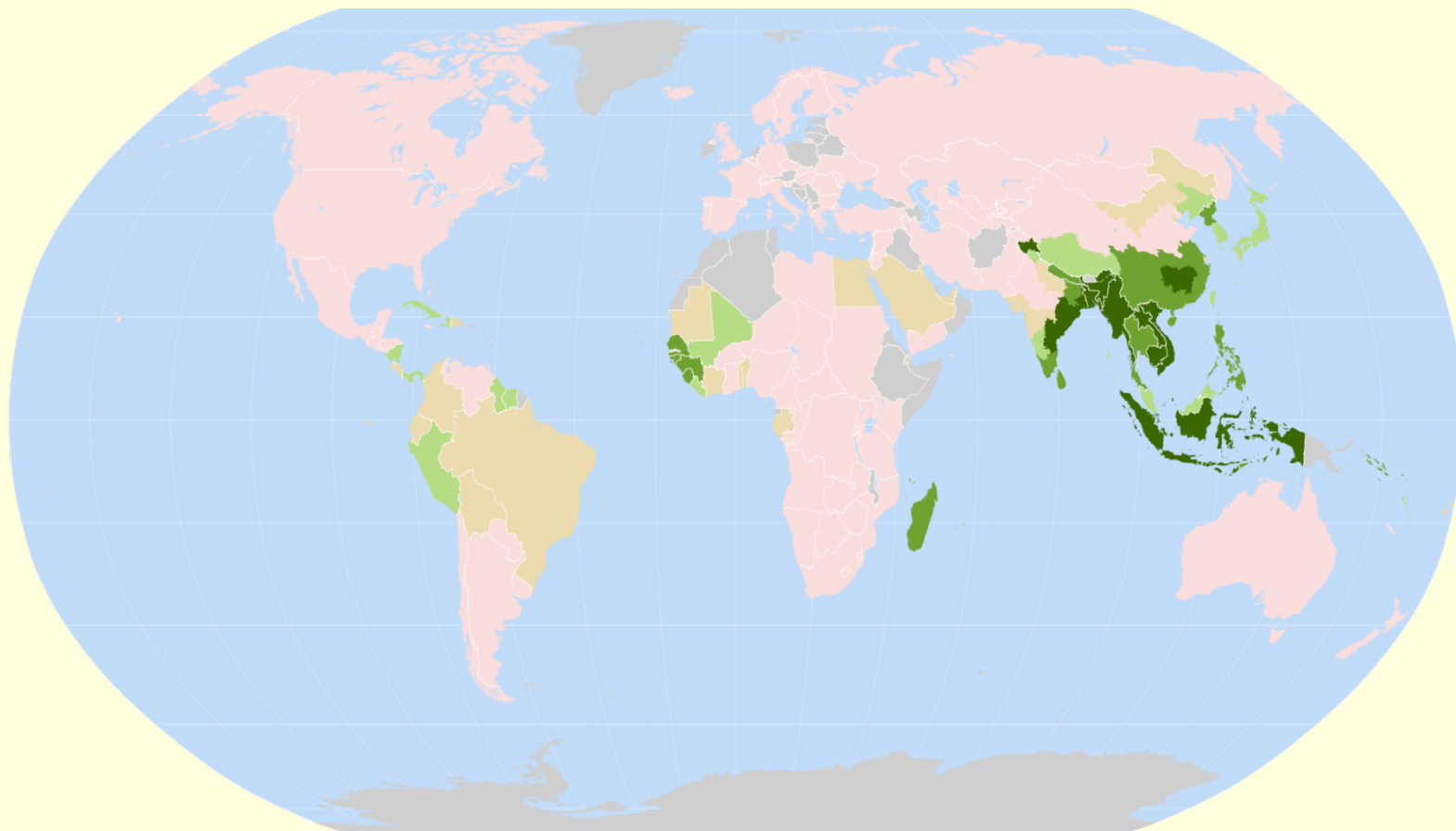


Hong Kong's rice bowl

- **7 million bowls of rice each day**
- **H\$ 4 million each day spent on rice**
- **It takes 290 ha of land each day to grow that rice**
- **It takes 4 billion liters each day to grow that rice**



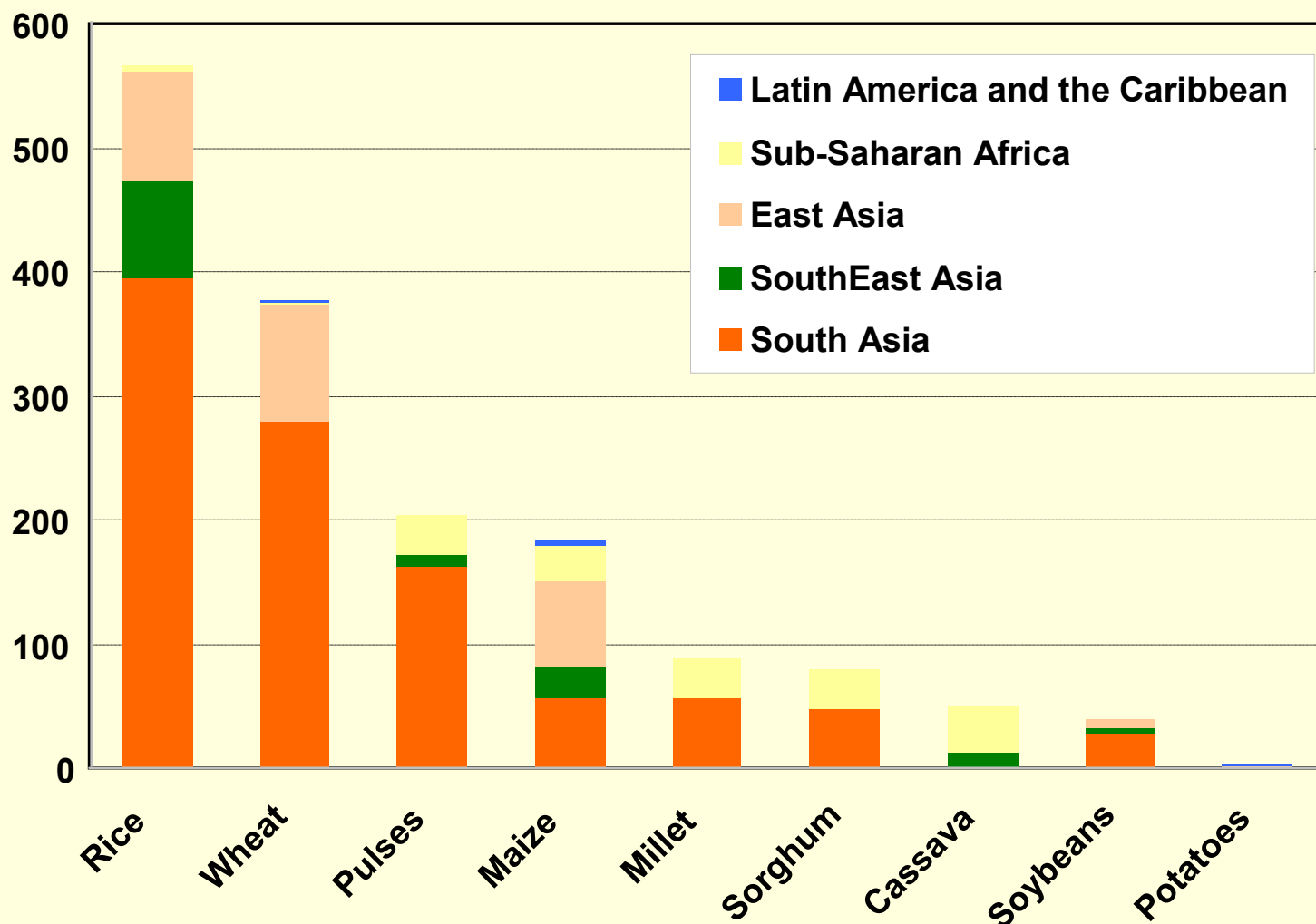
Share of rice of total calories consumed



< 10 10 - 20 20 - 30 30 - 50 > 50

% of calories coming from rice

Million people on <\$1.25 per day

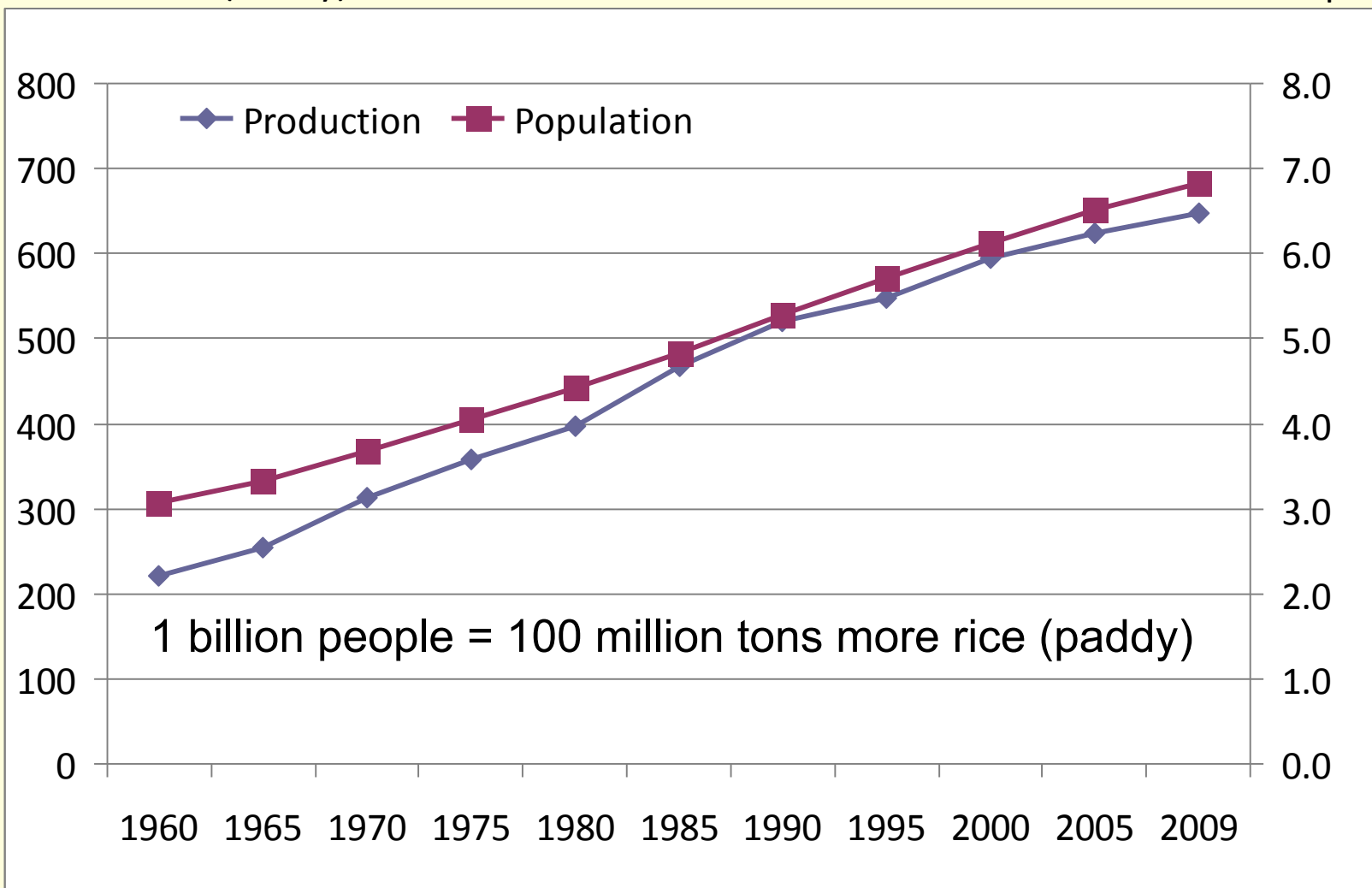


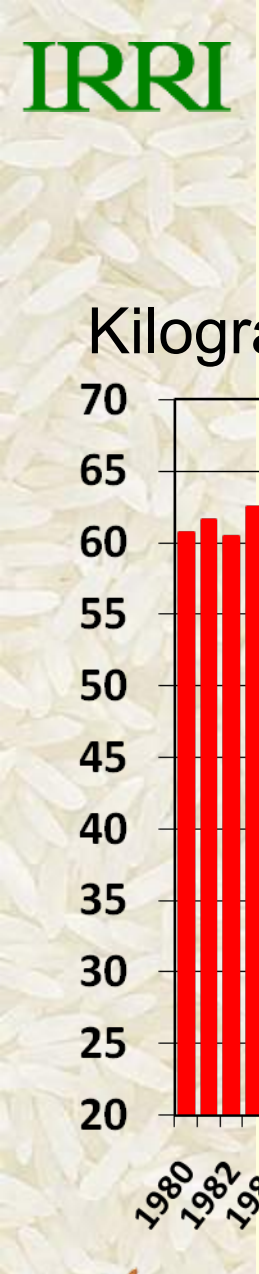
Number of people below the \$1.25 per day (PPP) poverty line who live in areas dominated by different crops (2005 data). Numbers are based on areas more than 10% covered by the dominant crop. Some areas have more than one dominant crop and thus overlap.

The Global Rice Equation

Million Tons (Paddy)

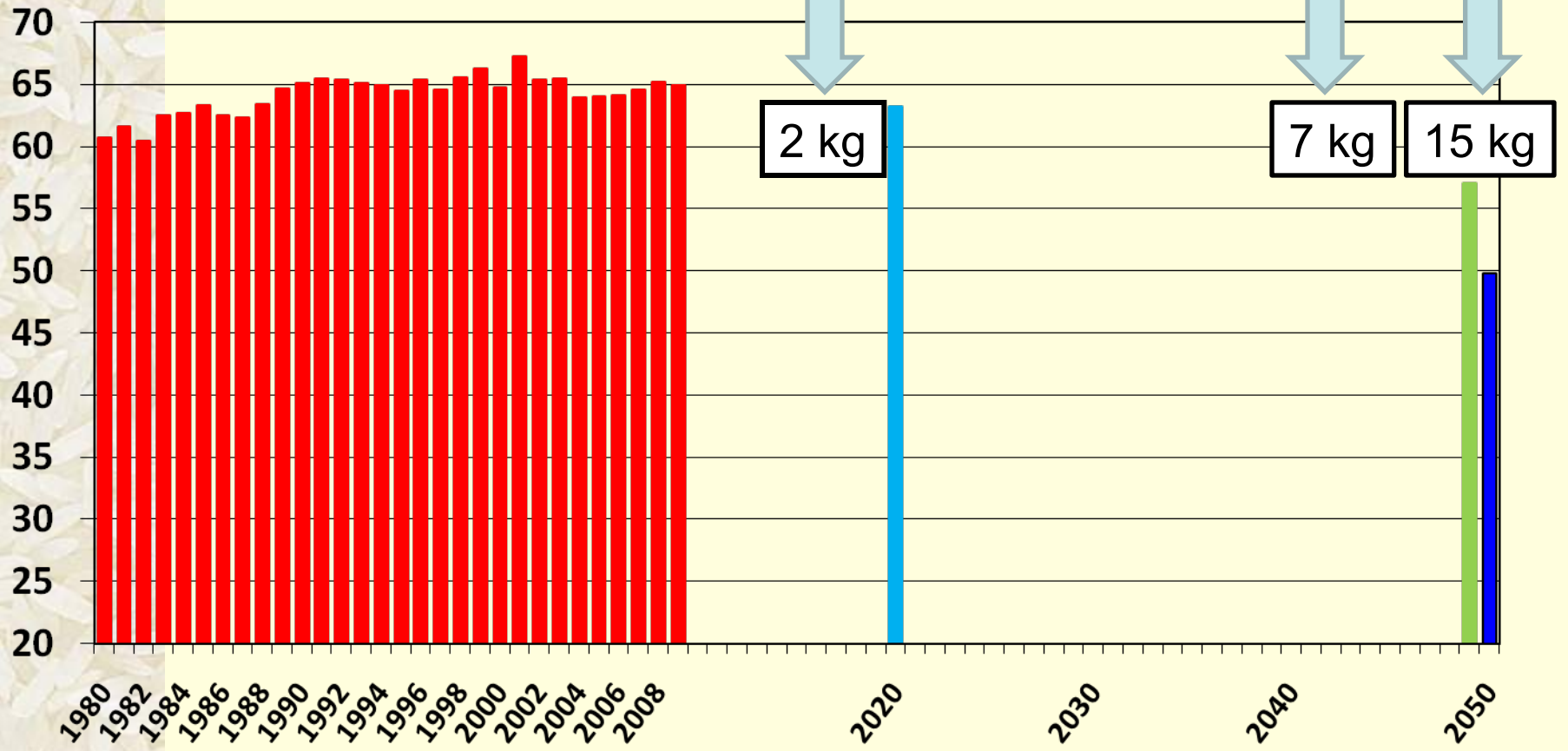
Billion People



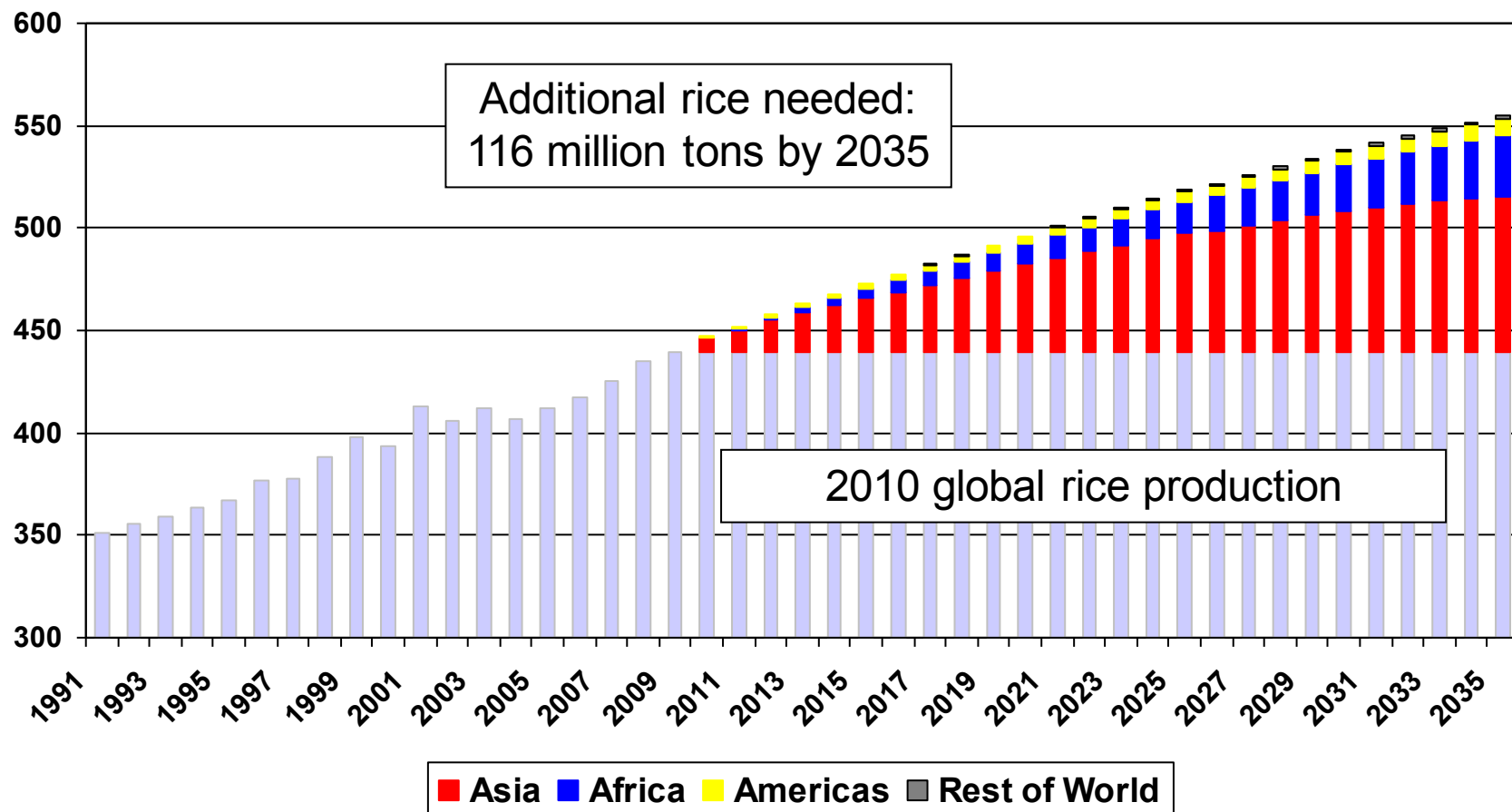


Global Per Capita Rice Consumption

Kilograms



Million tons milled rice



What needs to be done?

Rice demand:

- In each of the next 10 years produce at least 8 million tons rice more (rough rice) .

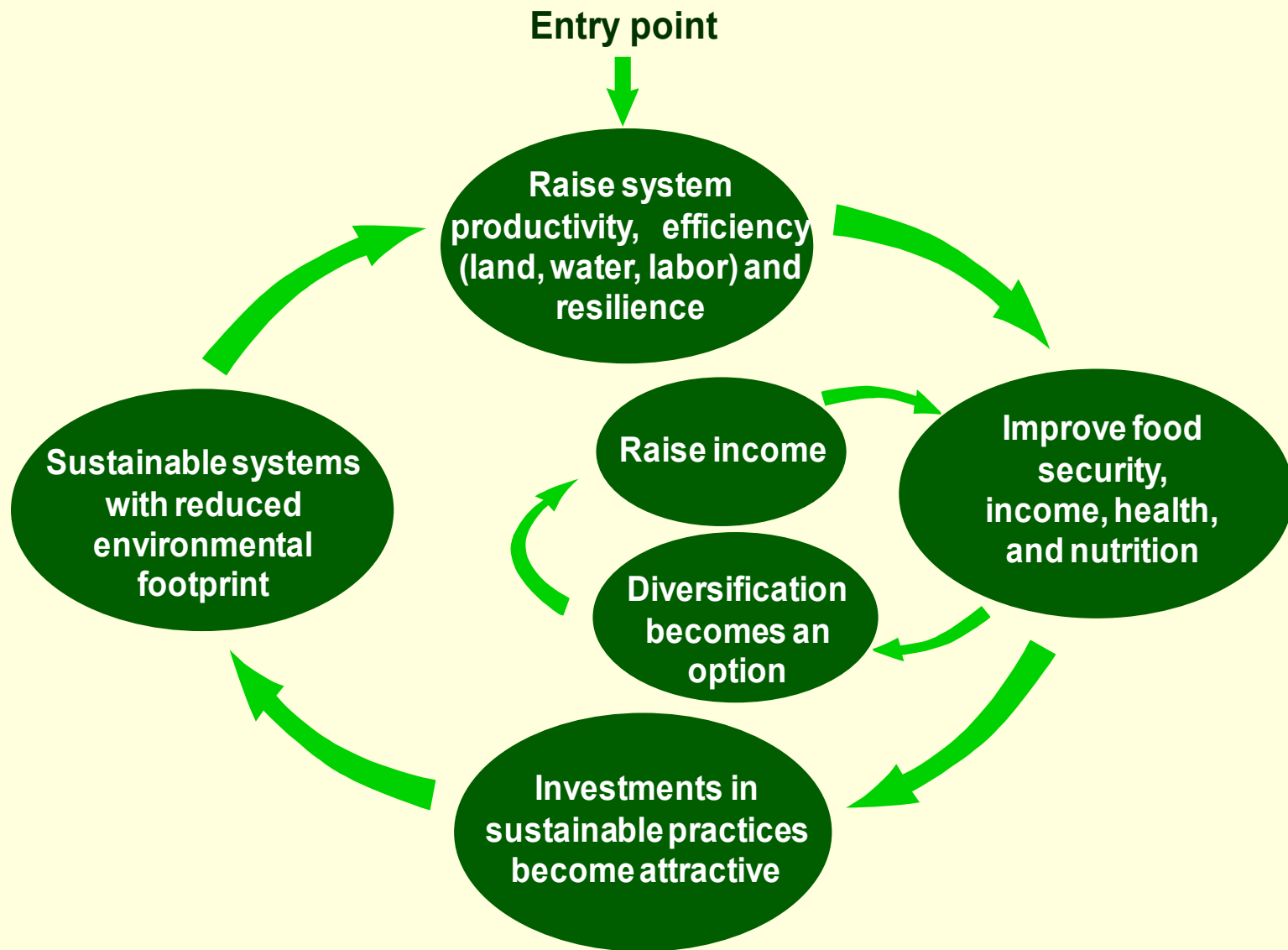
Rice supply:

- Little change in harvested area(155-160 million ha)
- Yield growth of 1.2-1.5% until 2020 (+0.6 t/ha); more in Africa
- Yield growth of 1.0-1.2% after 2020

Change how we grow rice:

- New seeds to adapt to changing climate
- Less tillage, less water, less labor, less pesticides, more efficient fertilizer use
- More resilient, diversified rice-based farming systems

Smarter people who implement these changes



Task Force Recommendations

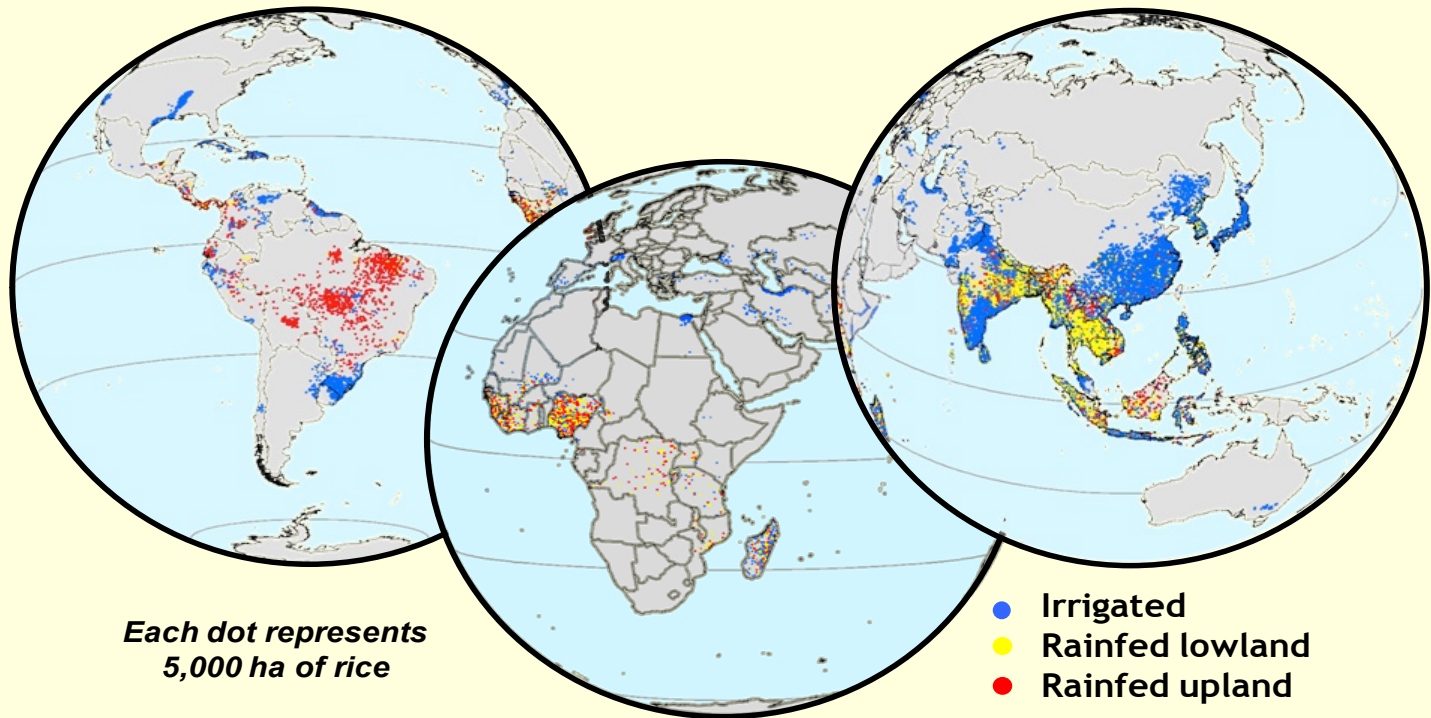
- 1. Raise and sustain productivity of rice farmers while building resilience to climate change**
 - Exploit the genetic diversity of rice
 - Rice breeding pipelines
 - Agronomic revolution – change how rice is grown
 - New high-yielding, diversified production systems
 - Improve postharvest technologies
 - New generation of rice scientists
- 2. Improve the environment for rural development (farm and non-farm activities)**
- 3. Provide safety nets and more nutritious food to the rural and urban poor**
- 4. Provide regional public goods for sustainable food security in Asia (Center for Coordination of Food Security Activities)**

Financial Dimensions

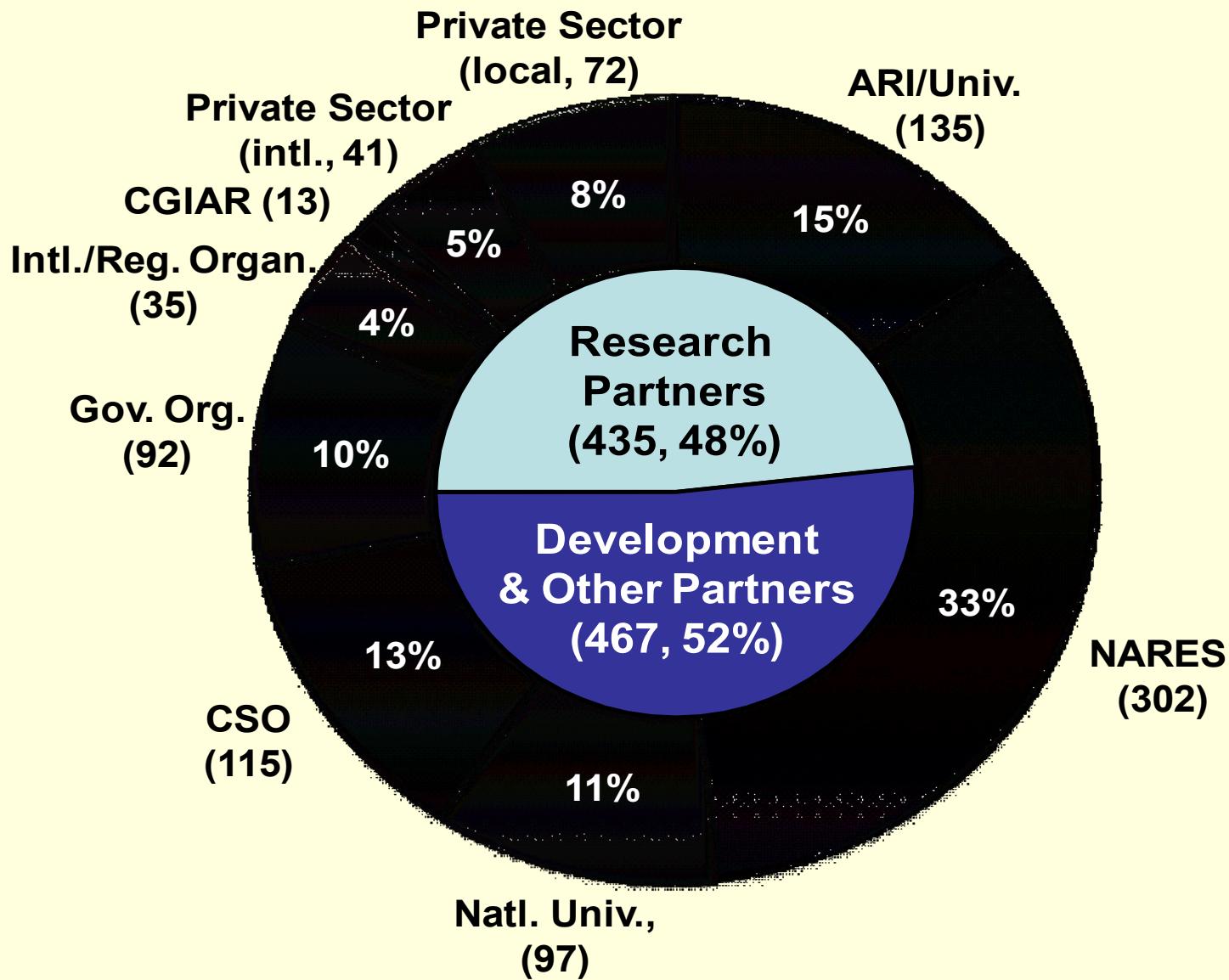
- **UN: additional \$40 bln on top of the current \$80 bln is needed for agricultural development to eliminate hunger and poverty in Asia by 2050**
- **International rice R&D: an annual investment of \$120-130 million between 2010 to 2035 could**
 - lift 130 million people in Asia out of poverty and 100 million out of hunger
 - spare 3 million ha land from being used for rice**→ \$20 to lift one person out of poverty**

**A CGIAR Research Program (CRP) in Thematic Area 3:
Sustainable crop productivity increase for global food security**

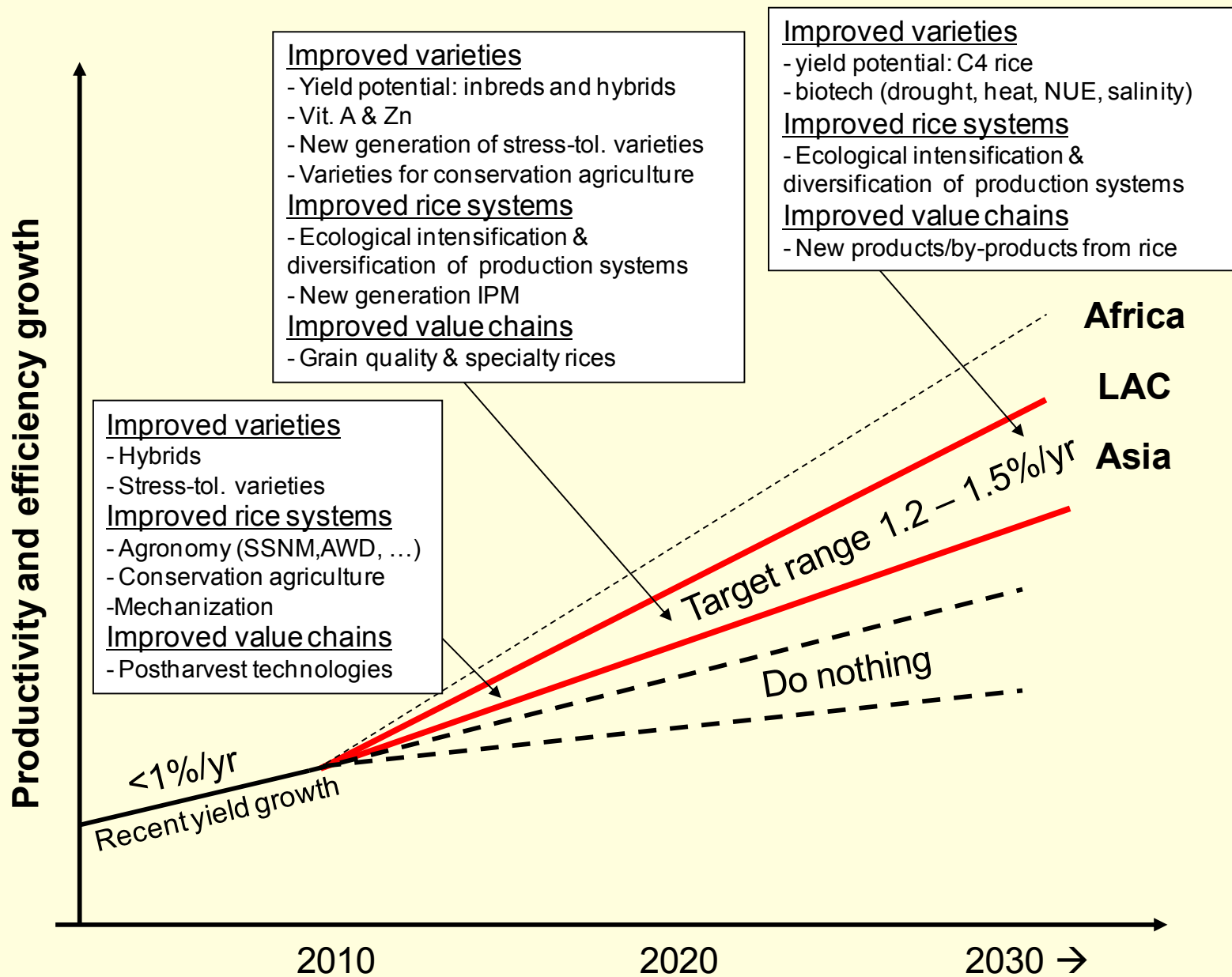
Global Rice Science Partnership (GRiSP)

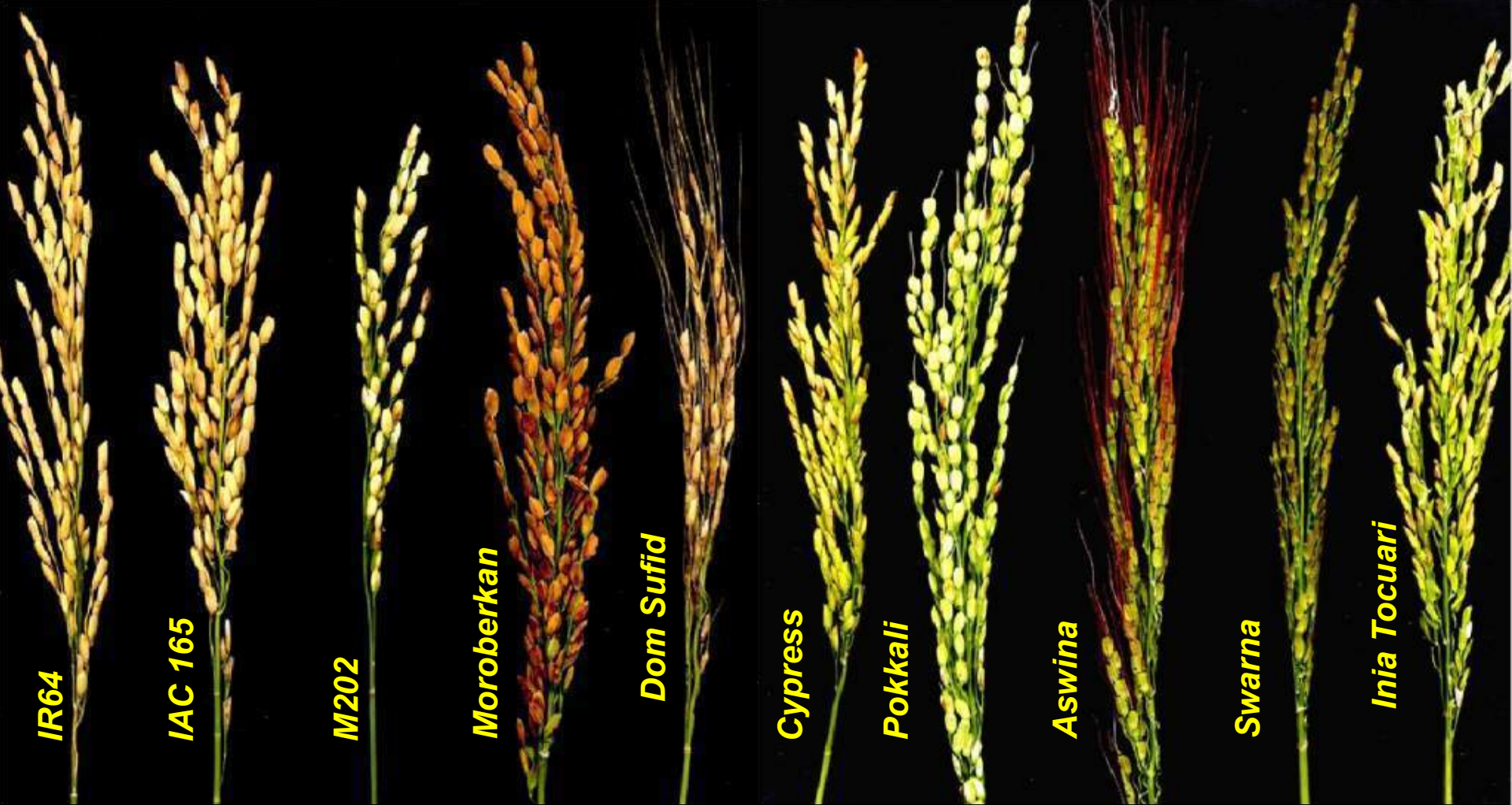


**An evolving alliance of IRRI, AfricaRice & CIAT
with Cirad, IRD, JIRCAS and hundreds of research and
development partners worldwide**



Over 900 R&D partners worldwide





IR64

IAC 165

M202

Moroberkan

Dom Sufid

Cypress

Pokkali

Aswina

Swarna

Inia Tocuari



Co 39



Patbyeo



Gerdeh

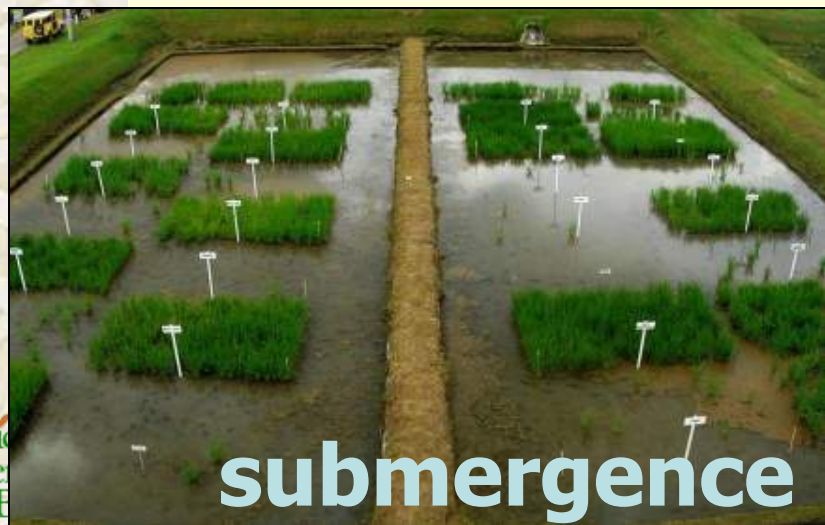


Dular



Sadu-cho

Making rice climate-proof





BRRRI dhan51 (sub1)

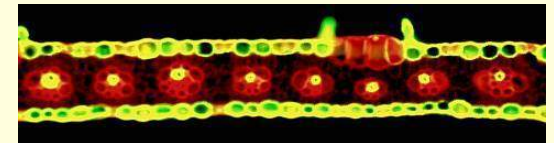
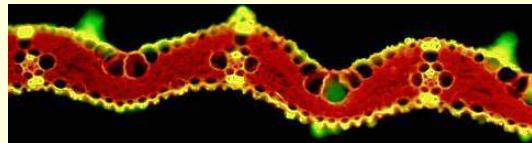
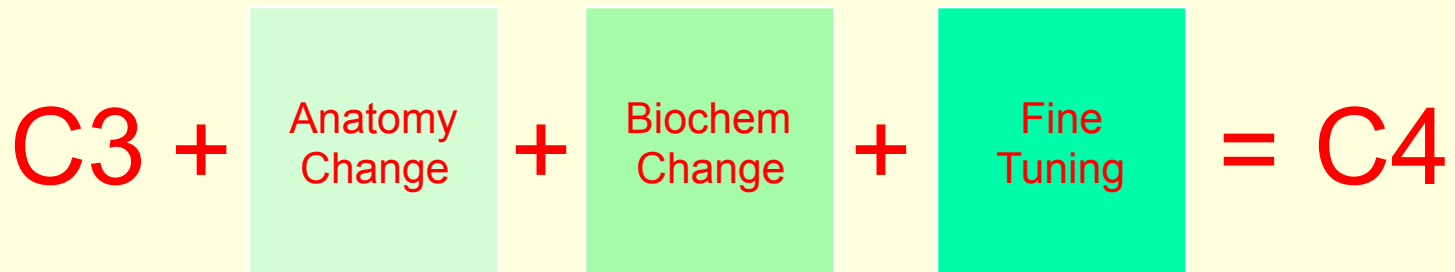
Damaged & re-planted local
rice field

October 1, 2010, Mymensingh district, Bang

Supercharging photosynthesis: C4 rice

A C4 rice should increase rice yield, water and nitrogen use efficiency by 30-50%.

No other evolutionary mechanism exists that could be added to a C3 rice so as to deliver that superior combination of benefits.



Massive international research effort needed for 20 years



Future rice-based systems

	Conventional	Reduced (Unpuddled)	Raised bed	Zero-tillage
Tillage	 A tractor with a leveling implement is working in a flooded rice field, creating a smooth surface.	 A tractor pulling a tillage implement, such as a moldboard plow, is shown in a field, turning over the soil.	 A tractor is driving on a series of raised, parallel beds in a field, demonstrating a zero-tillage or reduced-tillage system.	 A tractor is operating in a field with standing rice plants, illustrating a zero-tillage system where the previous crop is left in place.
Crop establishment		Transplant	Drum Seeding	Direct-drill-seeding
		 A group of workers is manually transplanting rice seedlings into a flooded field, one by one.	 A worker is using a drum seeding machine to plant rice seeds directly into the soil in a field.	 A tractor is pulling a direct-drill seeding machine, which plants rice seeds directly into the soil without the need for a separate tillage step.

A direct-seeded rice revolution in Asia?



Nutrient Manager provides farmers with field-specific guidelines

Computer via Web connection



www.irri.org/nmrice



- 1 Access web site
- 2 Answer 15 questions about field
3. Receive guideline via internet

Nutrient Manager for Rice Philippines Version 2.0

Name: Juan dela Cruz
 Mobile number: 09998887777
 Location: San Jose, Nueva Ecija, Region III
 Field size: 1 ha
 Variety: NSIC Rc122 (Angelica)

Rice crops per year: two
 Season: dry season
 Transplanted: 121-130 days from seed to harvest
 Seeding: less than 23 days

Decision tool for providing field-specific guidelines on nutrient management to rice

Select a language to start

English	Tagalog
Cebuano	Spanish
Hiligaynon	English

Download (localization)

Downloaded by: IRRI
 as a product of research collaboration with: PhilRice, University of the Philippines Los Baños

Values are adjusted to actual field area: 1 ha

Growth stage	DAT**	Current yield: 100 sacks at 50 kg/sack (4.5 t/ha (14% MC))	Higher yield***: 116-127 sacks at 50 kg/sack (5.3-5.8 t/ha (14% MC))
Early*	0-14	14-14-14: 3 bags	14-14-14: 4 1/2 bags
Active tillering	28-32	urea: 1 bag	urea: 1 bag
Panicle initiation	43-47	urea: 1 bag	urea: 1 1/2 bags

Consult PalayCheck for good crop management practices. >> <http://www.palaycheck.com>

* Application of fertilizer during early stage can be basal
 ** DAT - days after transplanting
 *** Achievable yield at the dry season with good management practices

Mobile phone SMS compatible



- 1 Call tool free number
- 2 Answer 12 questions about field
3. Receive guideline via text

NM Rice: For 94-105 sacks of rice on 1 hectare in dry season w/ good management practices: Apply 3 bags 14-14-14 basal or w/in 10 days after transplanting (DAT), 1 bag urea at 21 to 25 DAT, 1 bag urea at 30 to 34 DAT.

Available in the Philippines. Coming soon in Indonesia and other countries

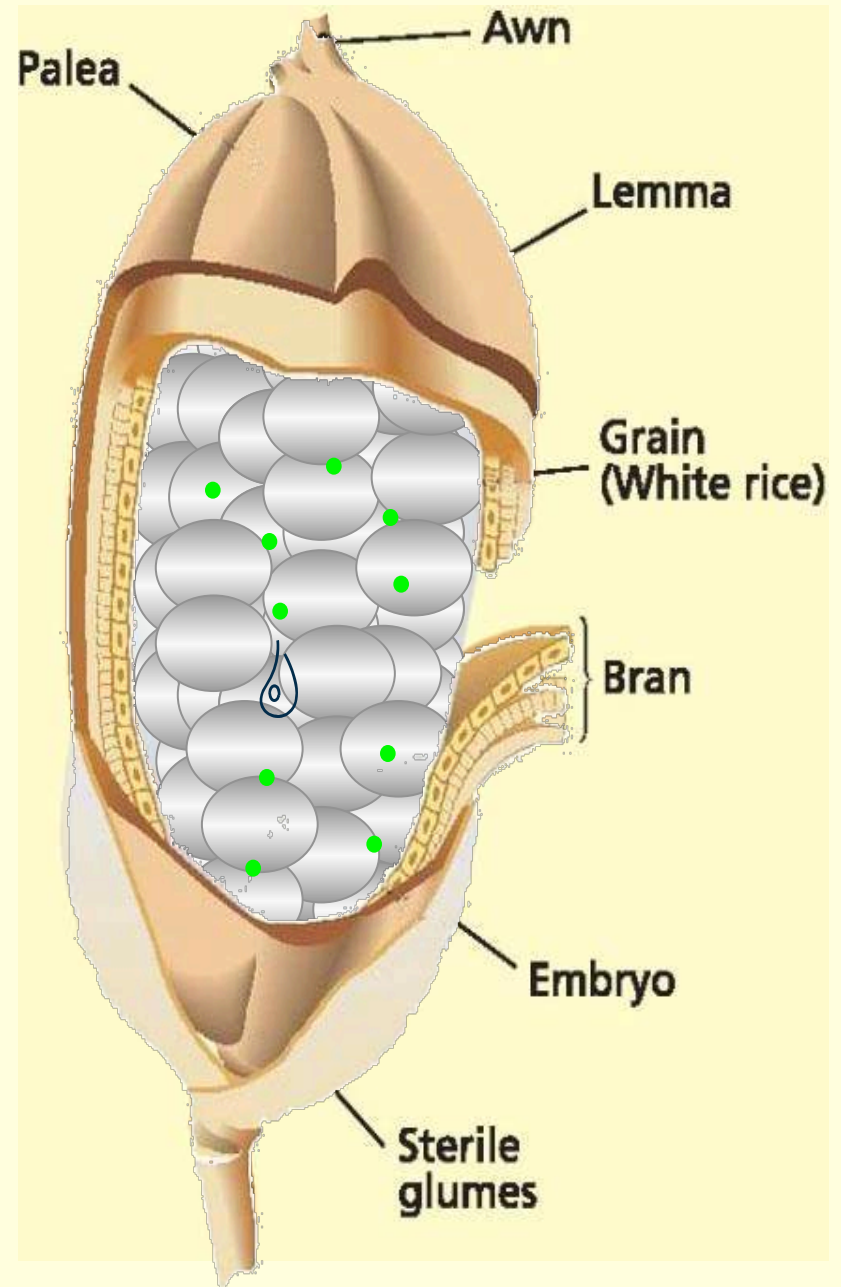
Rice grain:

- Starch (~94%)
- Protein (~5%)
- Lipids (~1%)

Change starch structure to:

- Reduce cooking time
- Lower glycemic index

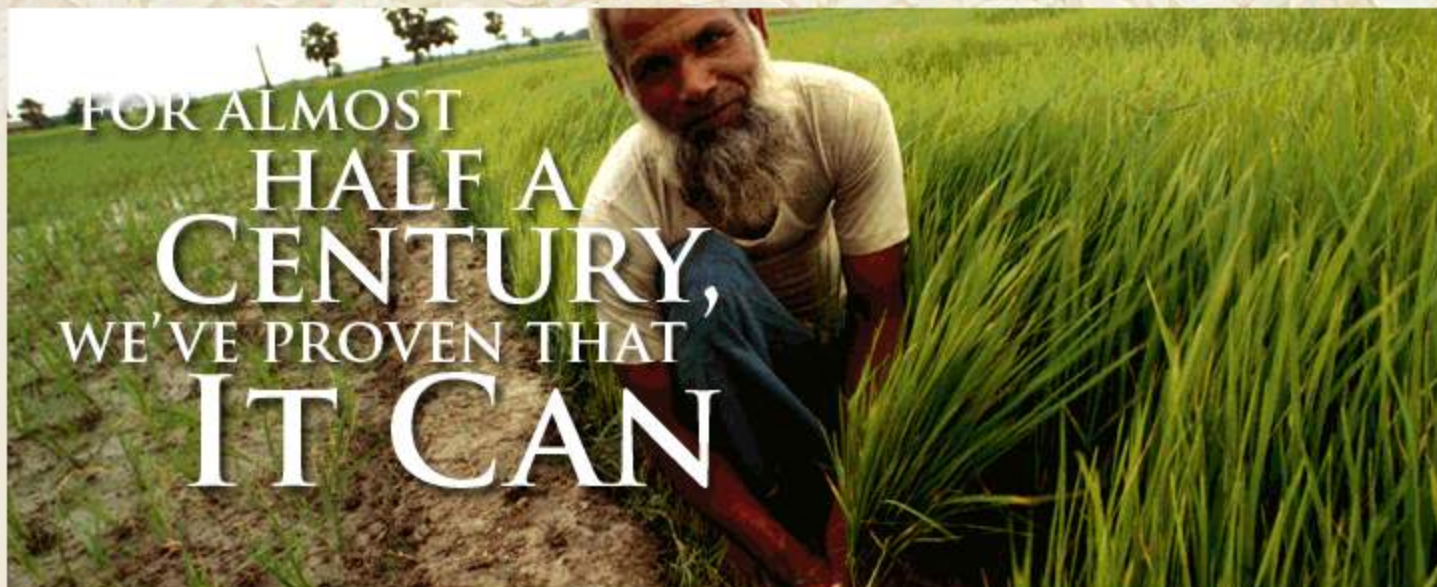
Decrease by 4 min =
10,000 years less
cooking time each day.



Some strategic initiatives in India

- **Transform rice production and livelihoods in Eastern Indian states**
 - Stress-tolerant varieties adapted to climate change
 - Conservation agriculture
- **A new molecular rice breeding center for India and other SAARC countries**
- **Mobile phone applications for providing crop information and financial services to farmers**
- **Attracting young people to work in science and agricultural extension**

CAN A GRAIN OF RICE CHANGE THE WORLD?



Never an empty bowl

US\$300 million fund-raising campaign
launched for rice food security in Asia



The Green Revolution is generally believed to have saved one billion lives over six decades, making it arguably the single-most-effective philanthropic initiative in human history.

March 9, 2008, The New York Times

DISCOVERY

DELIVERY

PEOPLE

FACILITIES

ENDOWMENT