

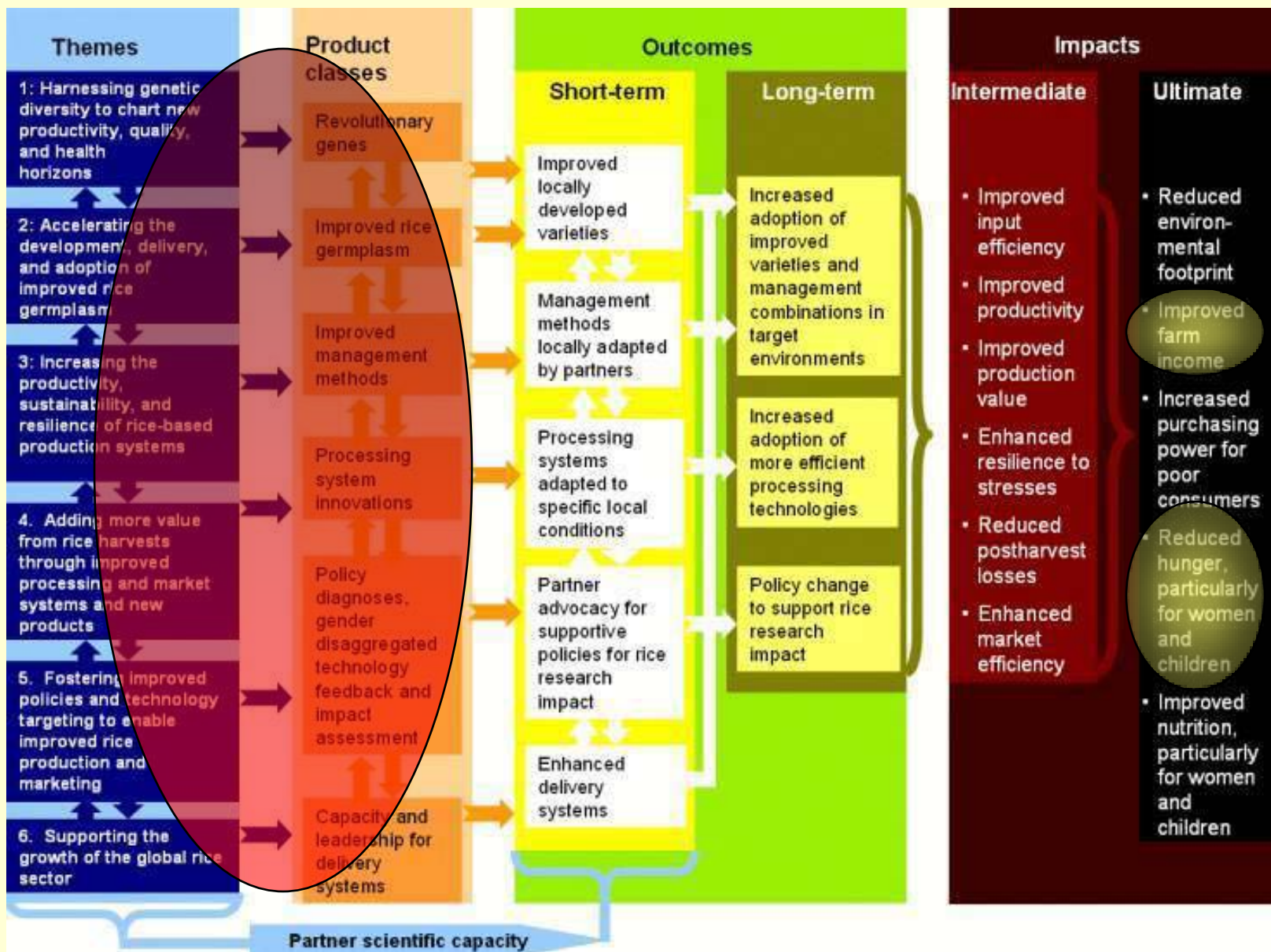
GRiSP

GRiSP Impact Pathways

Robert S. Zeigler
Director General, IRRI

Rice
Science
for a Better
World





From Here...

To Here

The problem of too much water



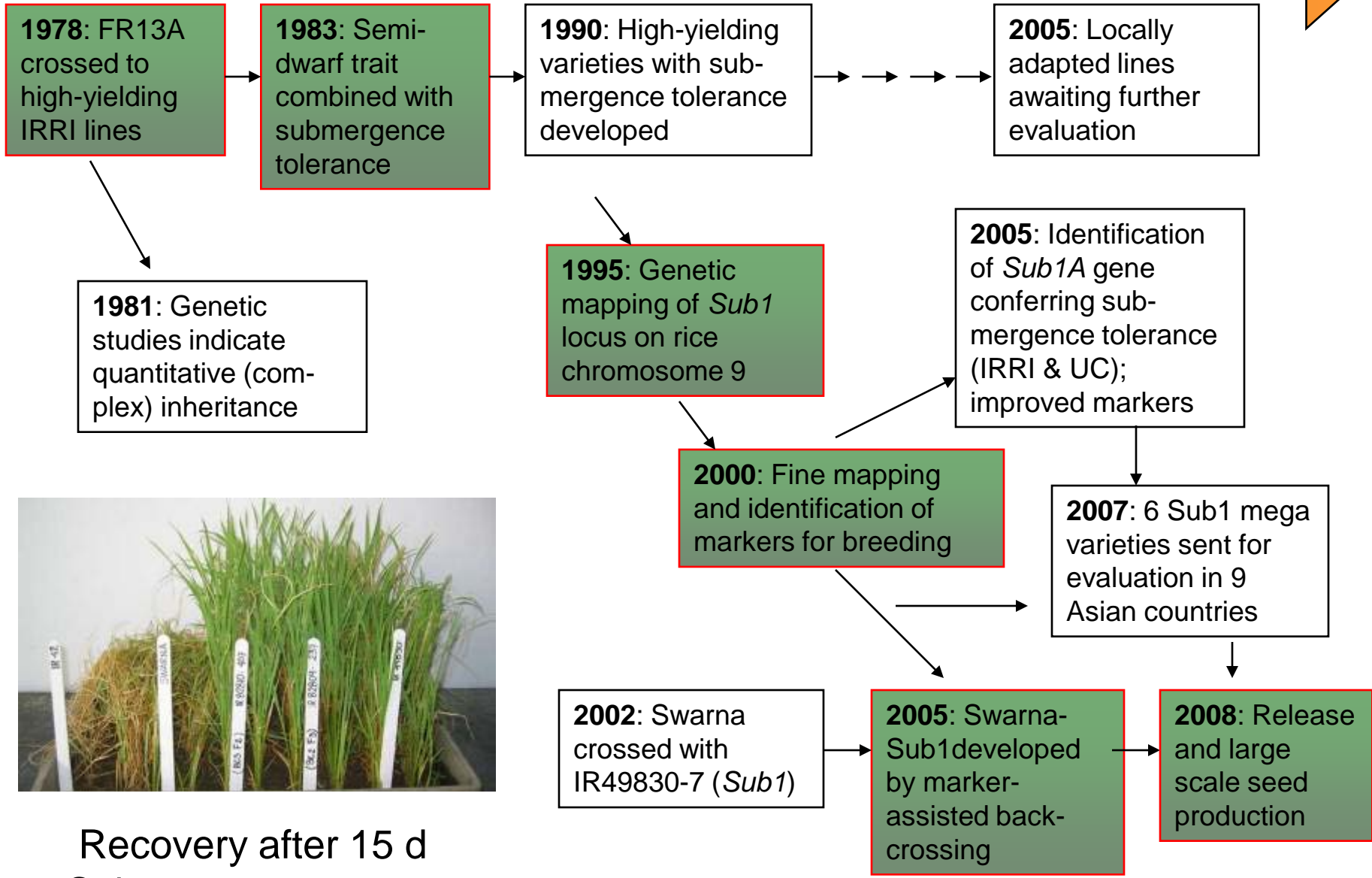
NASA: Terra Satellite

- 20 million ha affected in South and Southeast Asia.
- Growing problem with climate change.
- Rice is only crop suitable, but 'drowns'.

1978

Sub1 Timeline

2008



Recovery after 15 d
Submergence - 1978

Impact Pathway of *Sub1* varieties: Do they work in farmers' fields?

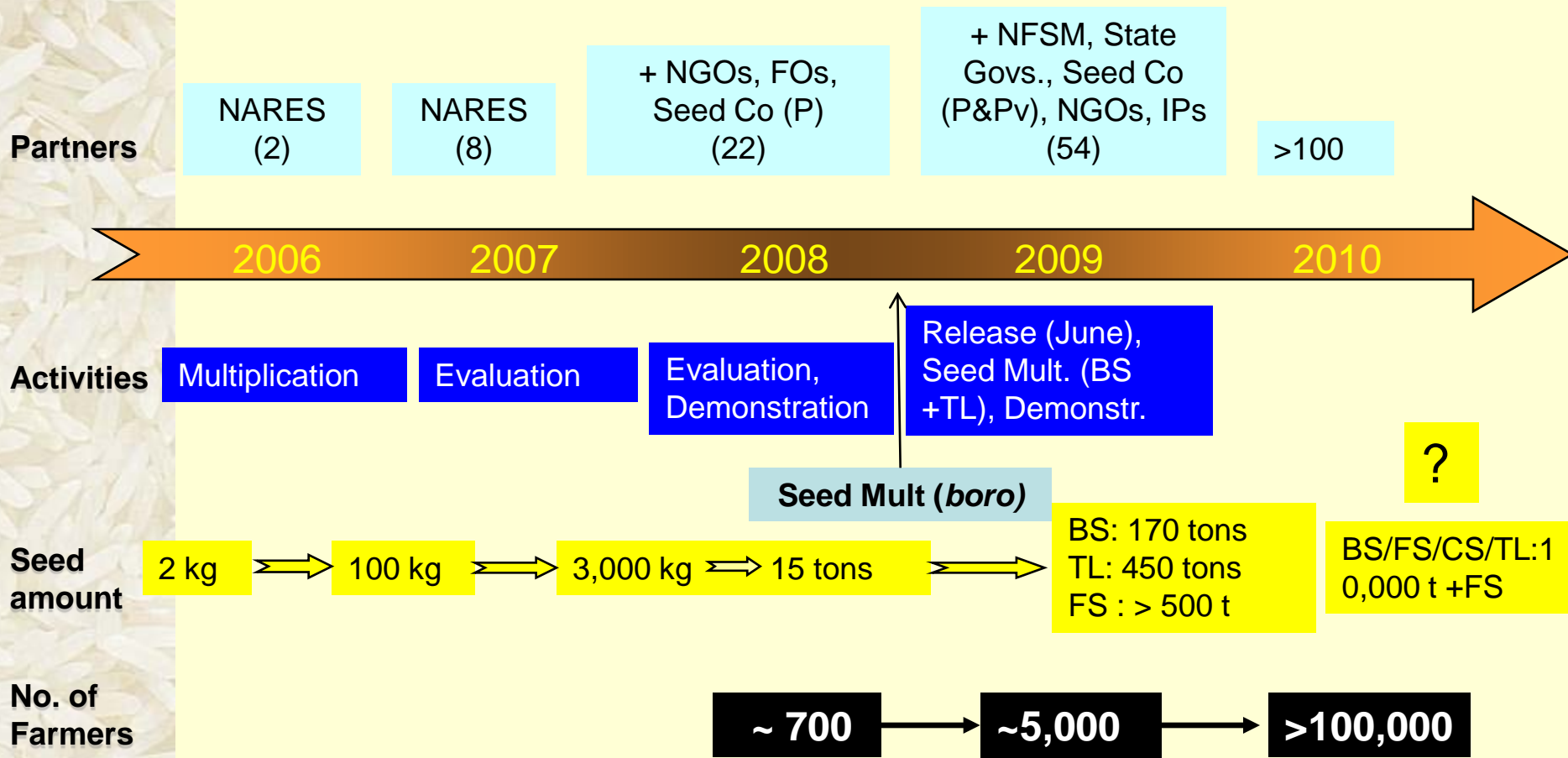


Multiple evaluations start across SE & S Asia (2006):

- ~ 1 t/ha advantage across ALL sites (even w/ no flood)
- 3 – 5 t/ha vs 0 under severe flood



Swarna-Sub1 Timeline in UP in India



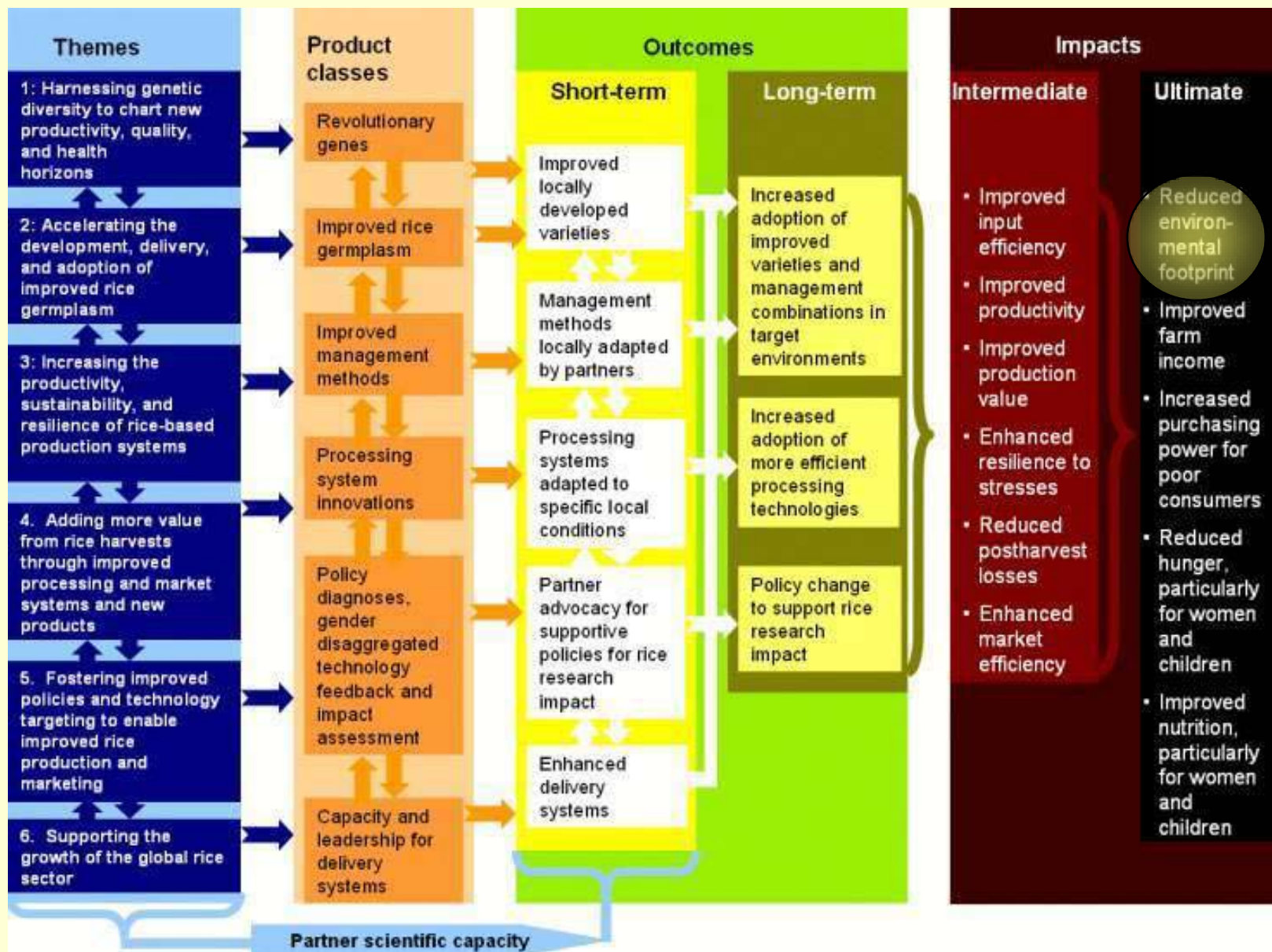
SWARNA-SUB1 IS EXPECTED TO REACH 1 MILLION FARMERS BY 2011 IN INDIA, > 1 M Ha by 2013

GRiSP Sub1: 68 Dissemination Partners in India

- **State Agricultural Universities (9)**
- **Federal/ State Government Organizations, Schemes, Banks (7, including National Food Security Mission)**
- **Farmers Organizations (3)**
- **State, Federal private seed companies (larger) (15)**
 - Including National Seed Corporation (NSC) and State Farms Seed Corporation (SFSC)
- **Small and medium seed companies/cooperatives (17)**
- **NGOs (17)**
 - International (Catholic Relief Services, Grameen)
 - National (local and nation - wide)

Conservative Impact?

- **2015: full adoption on 5 M ha flooded area**
 - **5 M t @ \$300/t = \$1.5 B per year**
 - **Rice security for tens of millions of people in areas not benefiting from Green Revolution I**



Better nutrient management:

Improper levels and formulations of fertilizers can damage environment and increase green house gas emissions

The need for fertilizer varies among fields, seasons, and years depends upon:

- Yield of the crop
- Amount of crop residue retained in the field
- Nutrients added with irrigation water
- Previous crop
- Soil fertility



What is a farmer to do???

Site Specific Nutrient Management: Key steps

1993 – 2000: Reversing Trends in Declining Productivity –
RTDP

- **Scientific principles developed**

2001 – 2004: Reaching Toward Optimal Productivity –
**RTOP workgroup of IRIGATED RICE RESEARCH
CONSORTIUM (IRRC)**

- **Research and extension brought together**

2005 – present: Productivity and Sustainability **Work group
of IRRC**

- **Country-specific guidelines developed and
disseminated**

SSNM must be made easy-to-use for extension workers and farmers

The technology is knowledge intensive

Printed materials became complex when giving best fertilizer practices farmers

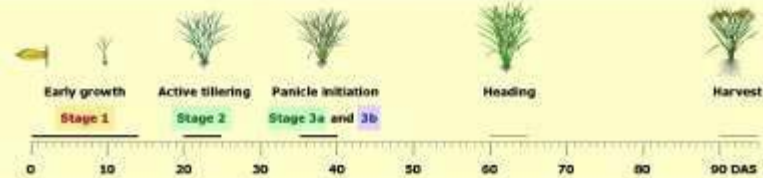
Boiled down to 20 simple questions

Implementing site-specific nutrient management (SSNM) for direct wet-seeded rice in Iloilo Province, Philippines

The guidelines given below apply for irrigated direct wet-seeded rice in Sta. Rita soil with

- Growth duration of 90–95 days (from seed to harvest)
- Yield targets of 5 and 6 t ha⁻¹
- Yield expressed at 14% water content

Apply fertilizer nitrogen (N), phosphorus (P₂O₅), potassium (K₂O), and zinc (Zn) at critical growth stages and days after sowing (DAS) as indicated below.



Stage 1. Apply fertilizer during early growth within 14 DAS.

Use the following steps and the table below to determine fertilizer needs for a specific field:

- Step 1. Select a yield target from the two options of 5 or 6 t ha⁻¹.
- Step 2. Select a fertilizer N rate from the table based on yield target.
- Step 3. Identify whether the historical level of fertilizer P₂O₅ application is above or below 20 kg ha⁻¹ per season in the past 2 years. Then, select a fertilizer P₂O₅ rate from the table.
- Step 4. Identify whether rice straw is historically removed or returned to the field. Then, select a fertilizer K₂O rate from the table.
- Step 5. For rice-growing areas where fertilizer Zn is recommended, apply 25 kg zinc sulfate ha⁻¹.

Fertilizer	Target location	Application (kg ha ⁻¹)	
		Yield target = 5 t ha ⁻¹	Yield target = 6 t ha ⁻¹
N	All fields	20	30
P ₂ O ₅	Fields receiving >20 kg P ₂ O ₅ ha ⁻¹ in each season for past 2 years	20	30
P ₂ O ₅	Fields receiving <20 kg P ₂ O ₅ ha ⁻¹ in each season for past 2 years	30	35
K ₂ O	Fields with straw removed	20	30
K ₂ O	Fields with straw returned	0	10–15
Zinc sulfate	Rice-growing areas where Zn is recommended	25	25

Single-element fertilizers or compound (NPK) fertilizers can be used to obtain the desired amounts of N, P₂O₅, and K₂O at the lowest cost.

Stage 2 and 3a. Topdress N as needed by the crop, based on leaf color.

Take LCC readings at active tillering and panicle initiation, and apply urea as indicated below.

- Panicle initiation (PI) is about 60 days before harvest.
- Active tillering is midway between 14 DAS and PI.

LCC reading (Immediately before N application)	Application of urea (bago ha ⁻¹)			
	Yield target = 5 t ha ⁻¹		Yield target = 6 t ha ⁻¹	
	Active tillering	PI	Active tillering	PI
LCC < 3	1.5	1.5	1.5	2
LCC = 3–3.5	1	1	1	1.5
LCC > 3.5	0	0	0	0

Stage 3b. Apply fertilizer K₂O at panicle initiation.

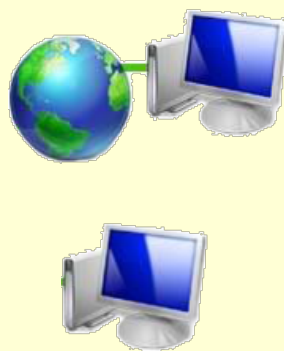
Apply 20 kg K₂O ha⁻¹ at panicle initiation in seasons and locations where rice stubble is removed rather than returned.

For more information, please contact

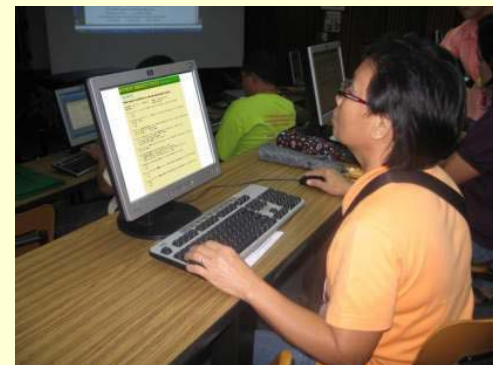
Prof. Greta G. Gabinete
West Visayas State University
College of Agriculture and Forestry, Lambunao, Solo
Email: gggabinete1@yahoo.com

Accessing Nutrient Manager via the internet and mobile phones

Computer
via Web
connection



**Nutrient
Manager
Web**



Mobile phone
via Web
connection



**Nutrient
Manager
Mobile**



Mobile phone
SMS
compatible

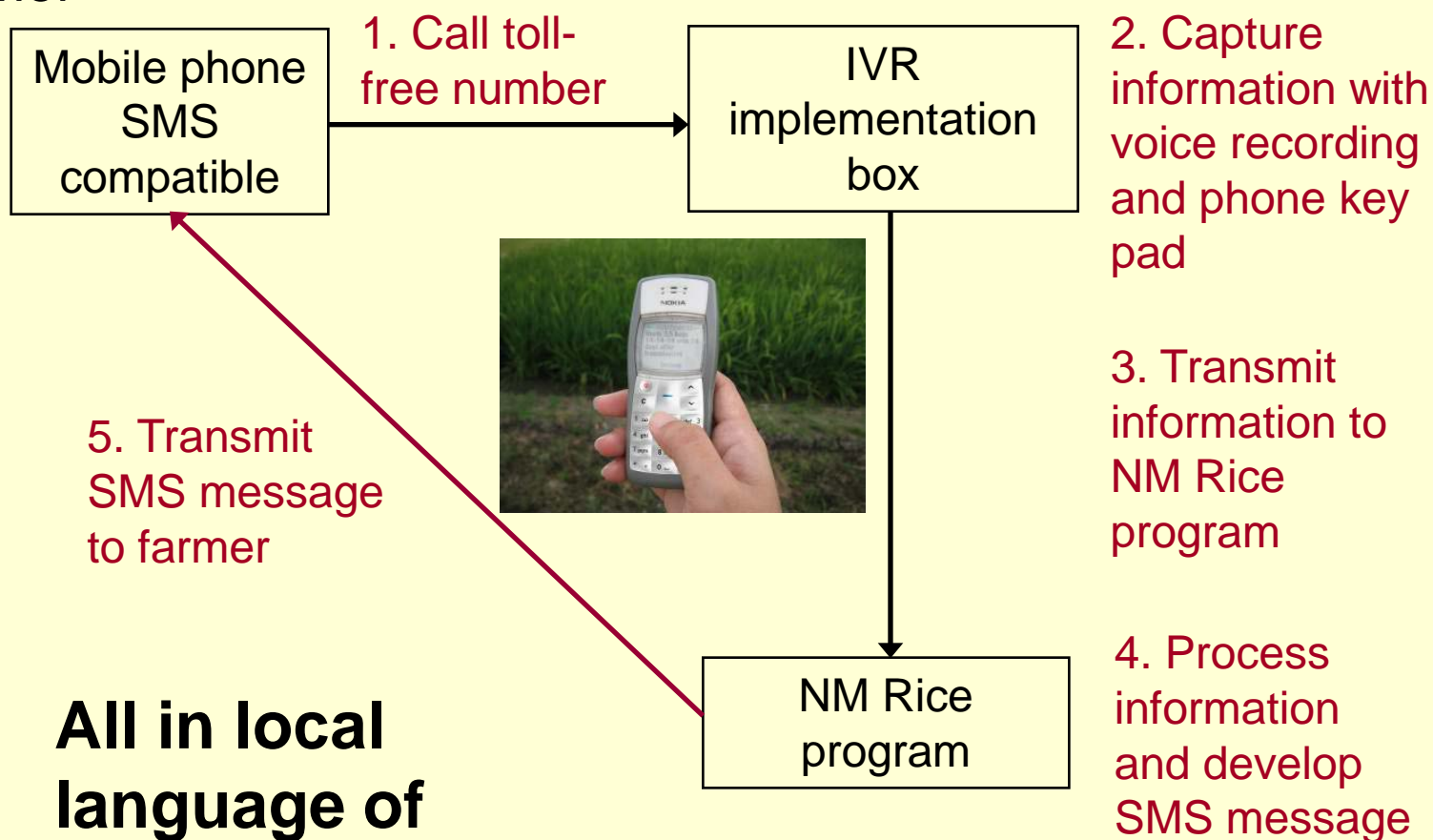


**Nutrient
Manager
Text**



Text version of *Nutrient Manager* (NMRiceTXT)

Farmer



**All in local
language of
choice**

Partnership with Nutrient Manager in the Philippines

Department of Agriculture

- **Mechanisms for getting information to farmers**
- **Promotion**

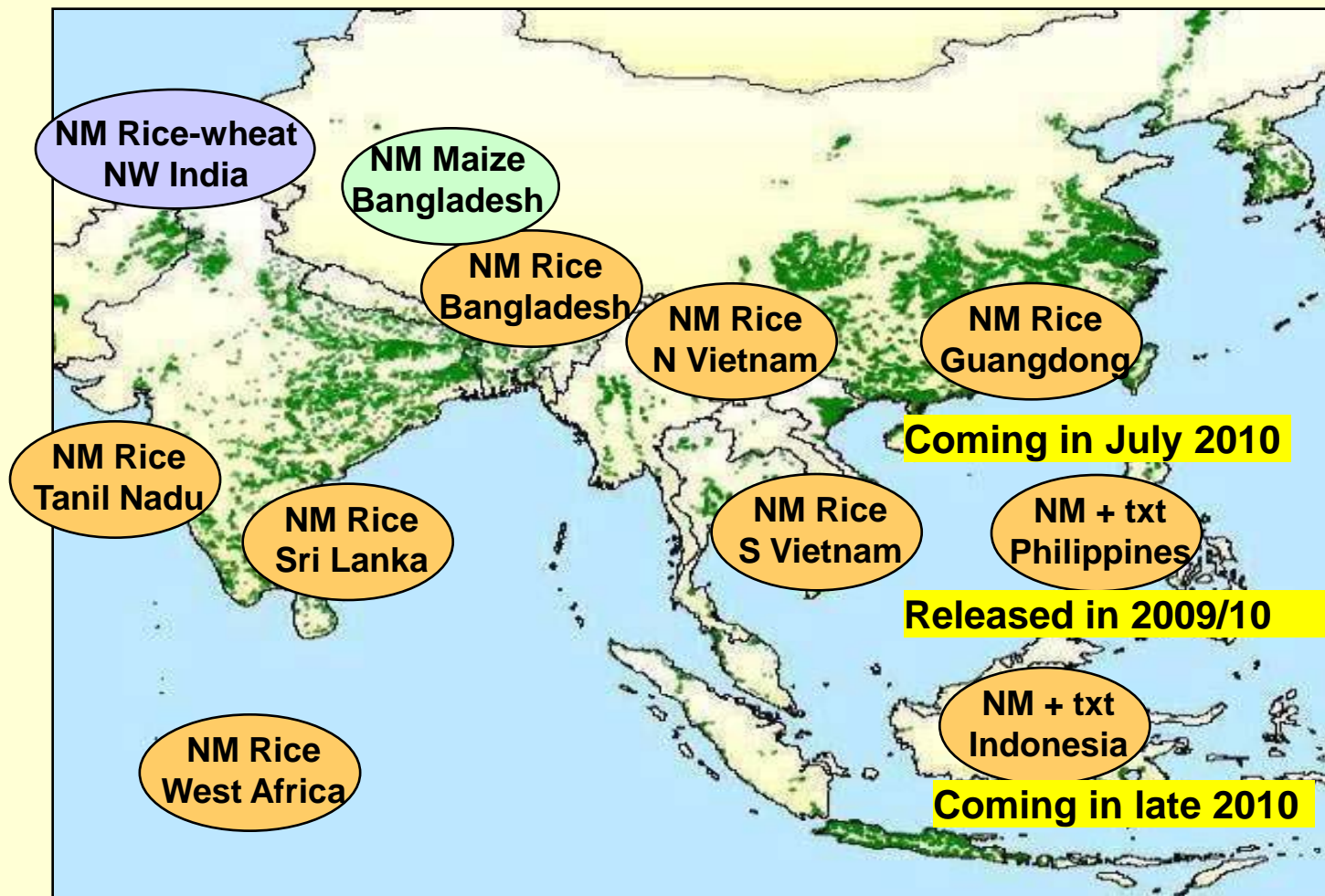
Phone company (SMART, Globe and SingTel so far)

- **Four-digit toll free phone number**
- **Sustained support**
- **Credit?**

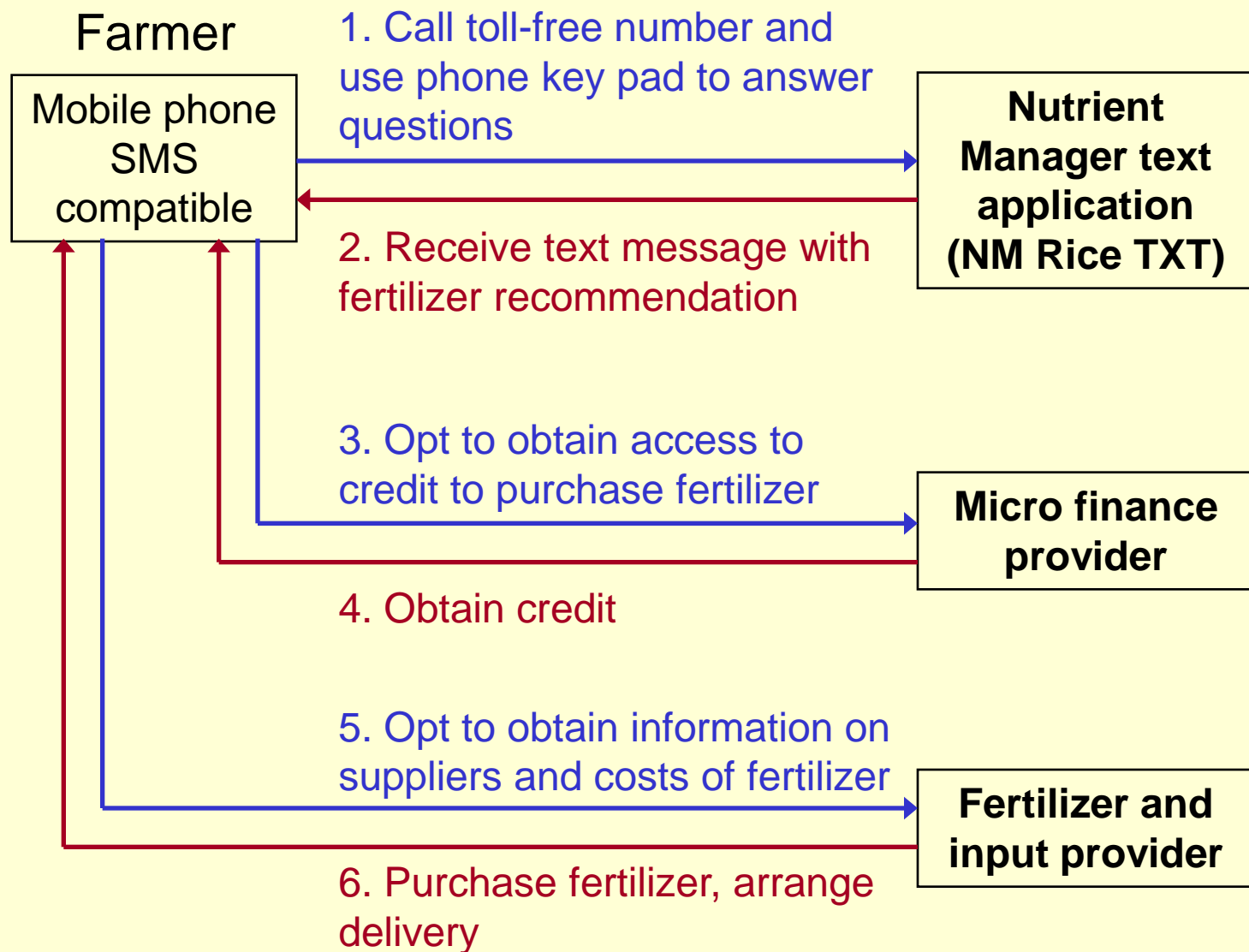
IRRI

- **Knowledge on improved rice production practices**
- **Analytical software on Institute servers**

Nutrient Manager released or under development and field evaluation before release

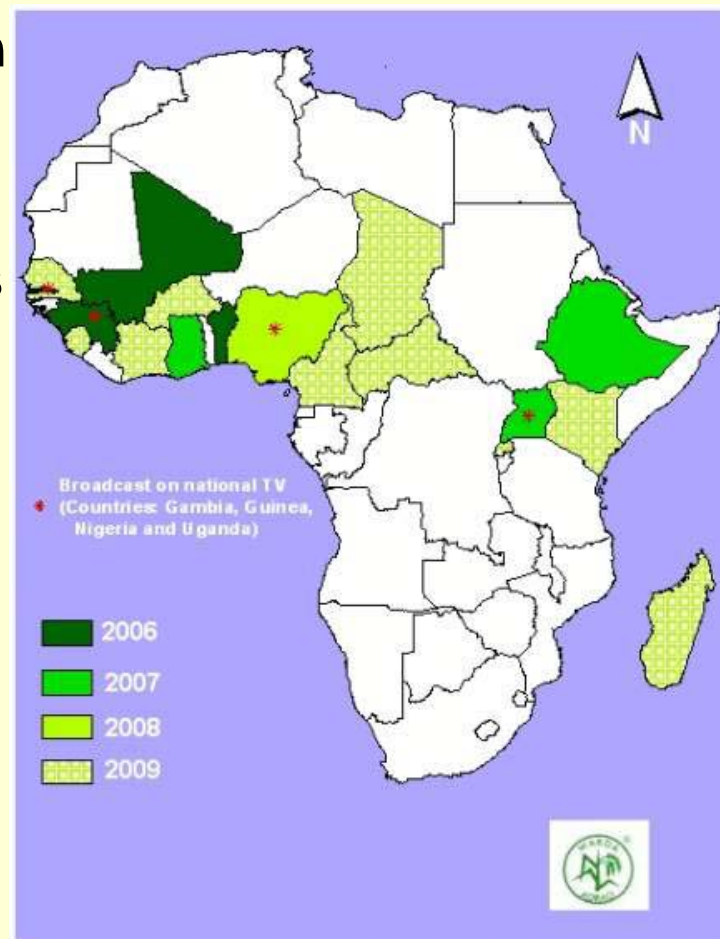


Access to credit: Cracking one of the most difficult nuts in development?



Rice Rural Learning Initiative for Best Management Practices: AfricaRice

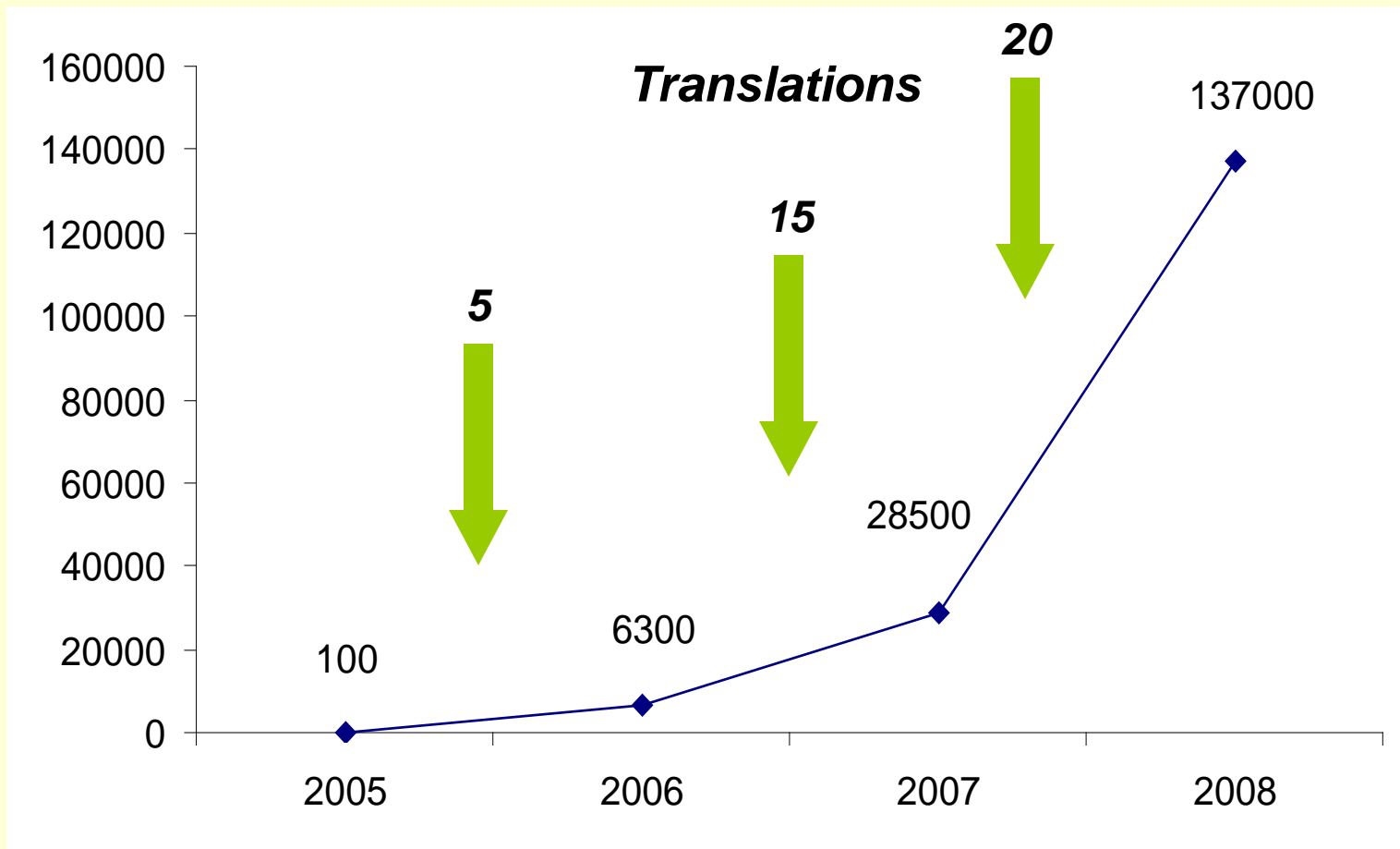
- NARS and NGOs
- Countrywise Communication to train local video team, with participants from multiple institutes
- NARS and local partner organizations to produce rice videos with farmers
- national media professionals to translate 11 videos into 33 African languages
- Farm Radio International to produce & distribute radio scripts and videos DVDs to 300 African radio stations
- Private sector and 600 organizations to have maximum outreach to rural communities
- National and international universities to assess impact

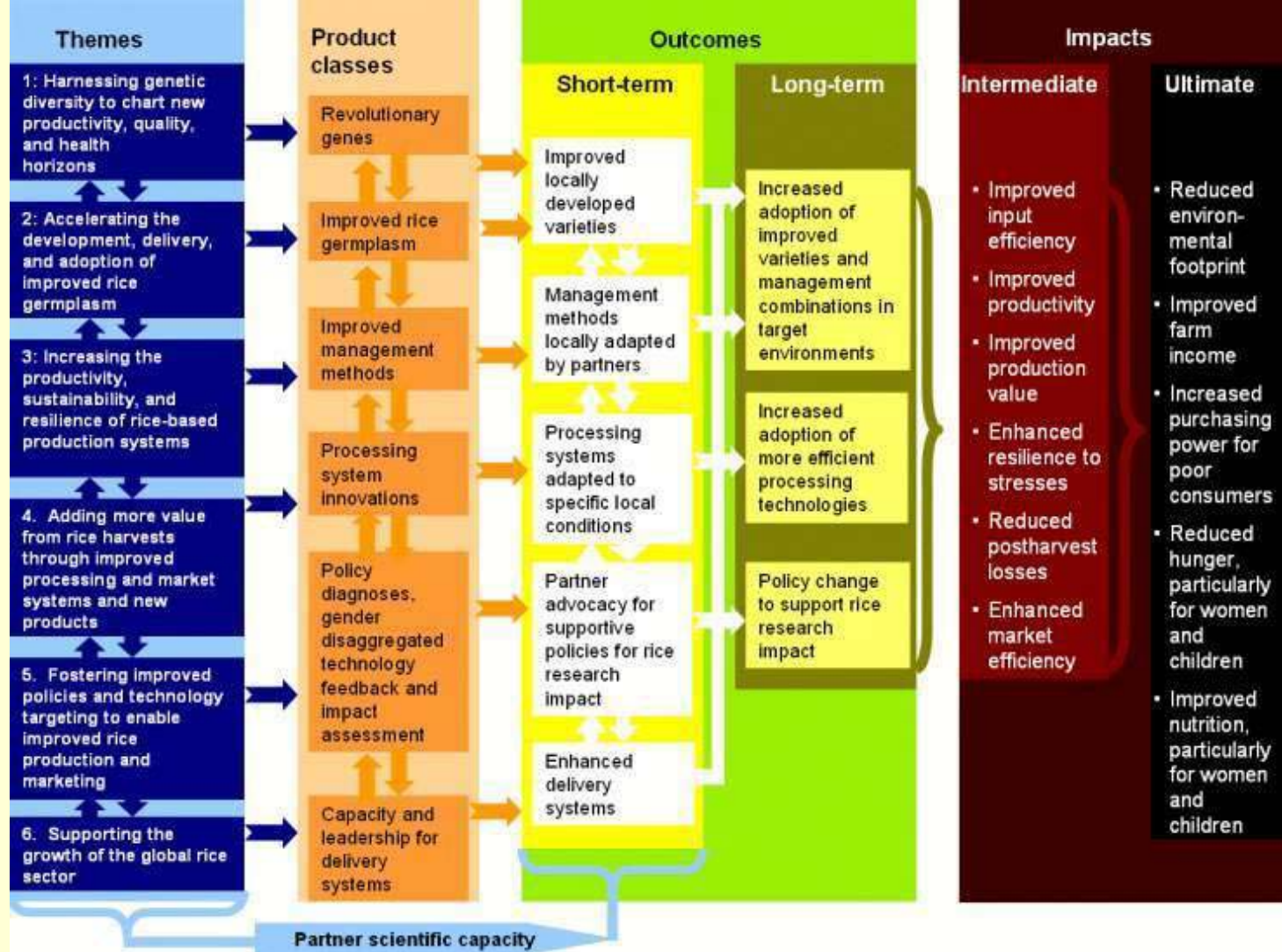


Video 'cinema ambulante'



Number of farmers reached with videos





You Can Get There From Here...it just takes a good product, support, time and the right partners

GRiSP

Thank You