



Research Program on Rice

CGIAR is a global research partnership for a food secure future

CRP 3.3: Global Rice Science Partnership (GRiSP) II Outline

Bas Bouman, Director
GRiSP

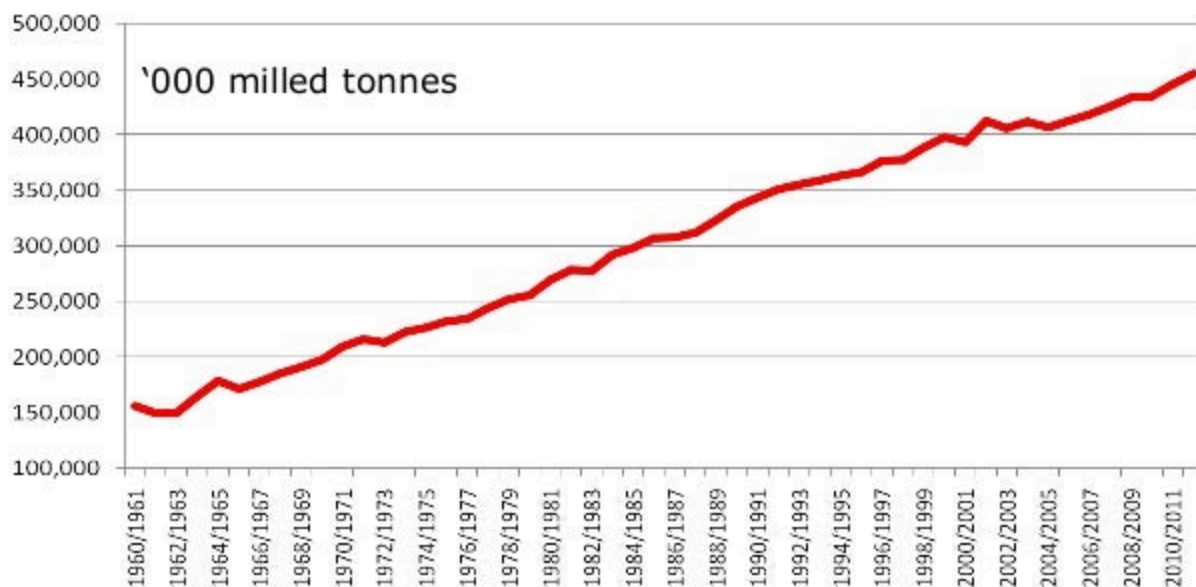
Overview

1. Justification and structure GRiSP
2. Towards GRiSP II: IDOs, Impact Pathway, Theory of Change, gender, capacity building
3. Performance indicators
4. Geographic focus
5. Partners
6. Draft budget



Why rice why GRiSP?

- 120 million rice farmers feed 3.5 billion people
- 1 billion people extremely poor and 650 million hungry depend on rice – more coming...



No slowdown in
global rice
consumption

Rice fastest
growing food
commodity in
SSA





=> Increase rice production that is affordable to poor and profitable to farmers

But... future: less and more expensive resources, more hostile environment (climate change), need to be sustainable and safeguard environment

Global challenge and global threats

⇒ concerted global action

⇒ GRiSP




GRiSP: a global response

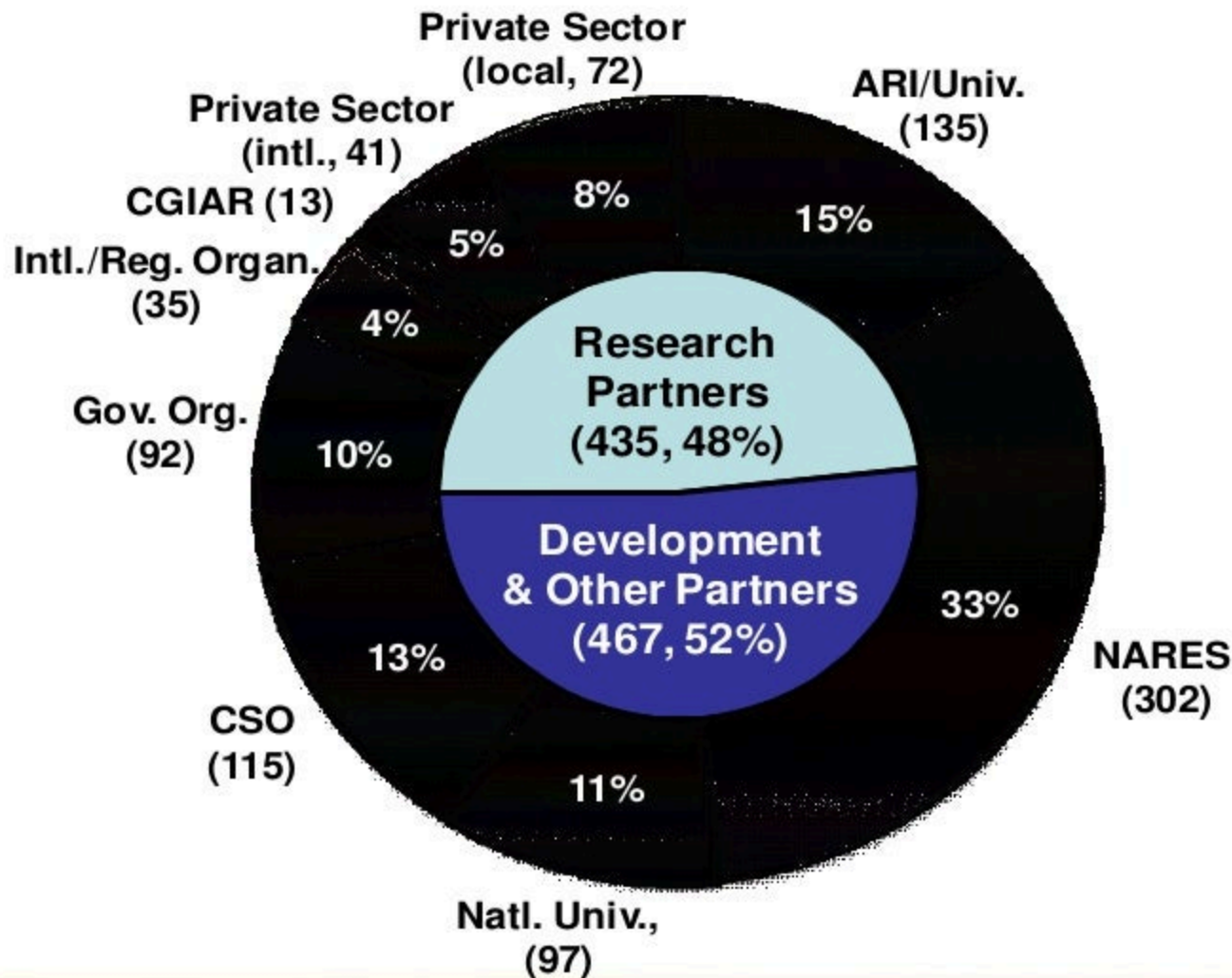
- A global partnership led by IRRI
- Coordinating and founding partners:
AfricaRice, CIAT, CIRAD, IRD, and JIRCAS
(international mandate)
- Shared vision, goals, objectives, R&D
- For a value of 90-95 M \$/year
- Current phase: 2011-2015



Targets 2020 (GRiSP I)

1. Expenditures on rice by those under the \$1.25 (PPP) poverty line will decline by nearly PPP \$5 billion annually.
 2. Counting those reductions as income gains: 72 million people would be lifted above the \$1.25 poverty line, reducing global poor by 5%.
 3. 40 million undernourished people would reach caloric sufficiency in Asia, reducing hunger by 7%.
 4. Approximately 275 million tons of CO₂ equivalent emissions averted.
- 

GRiSP: a global partnership



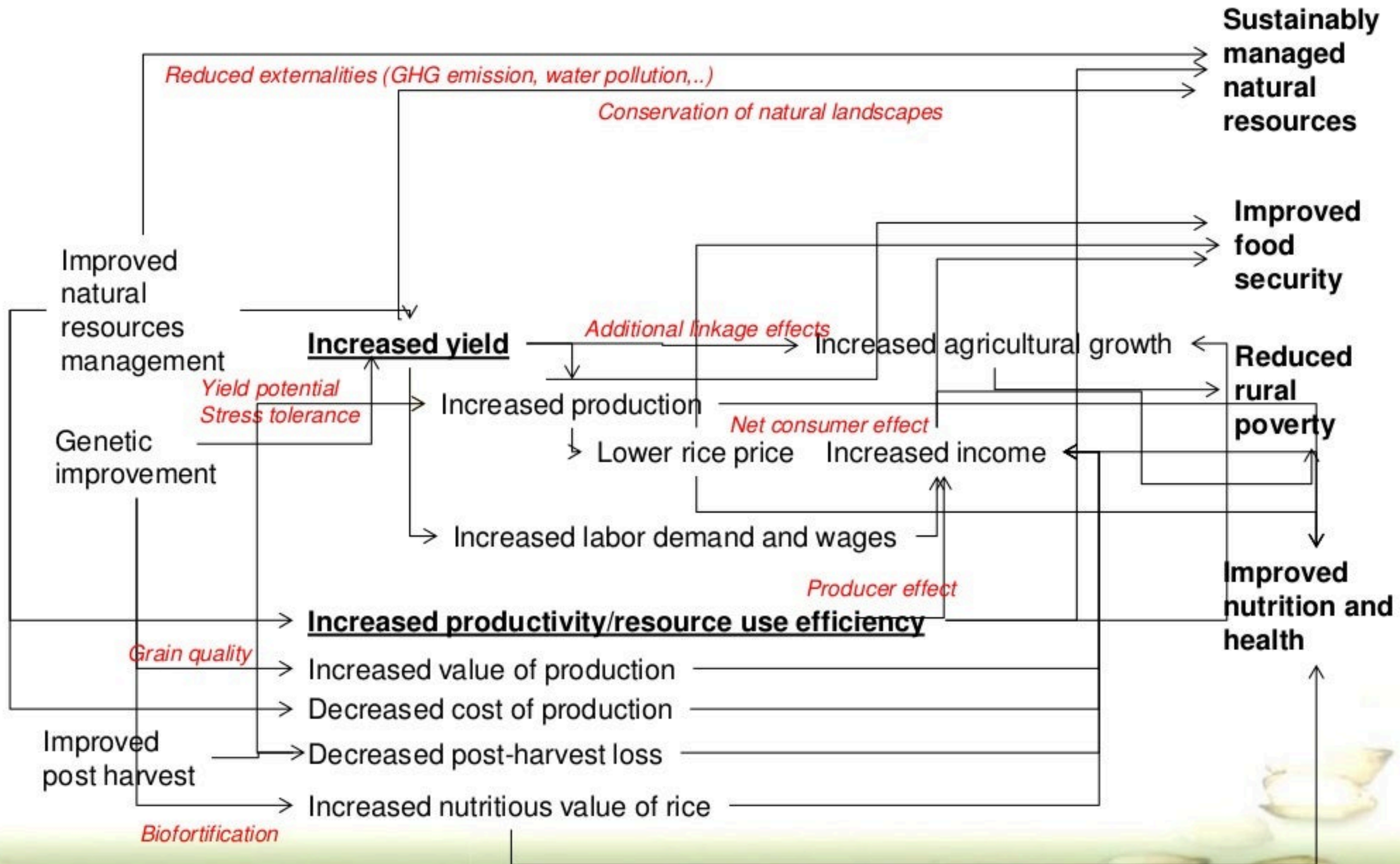
Coordinating institutes have over 900 research and development partners



GRiSP Mission and CGIAR System-Level Outcomes (SLOs)

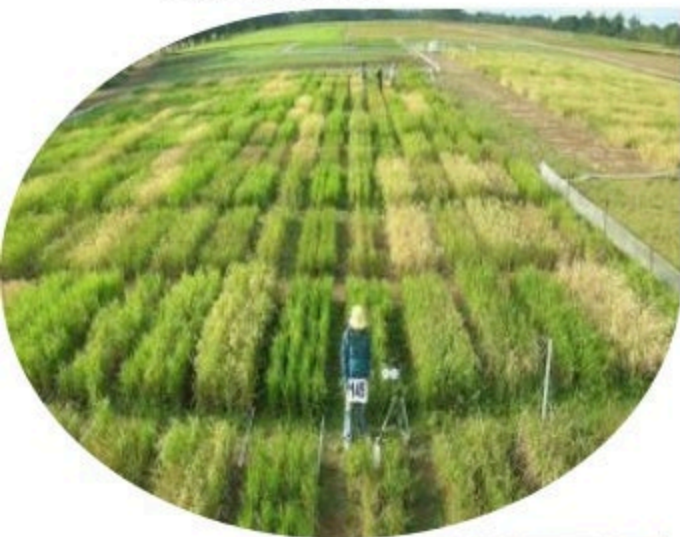
GRiSP	GCIAR-SLO
1. Reduce poverty and hunger	1. Reduced rural poverty 2. Increased food security
2. Improve human health and nutrition	3. Increased health and nutrition
3. Reduce the environmental footprint and enhance the ecosystem resilience of rice production systems	4. Sustainable natural resources management

Research evidence base



Research themes

Genes



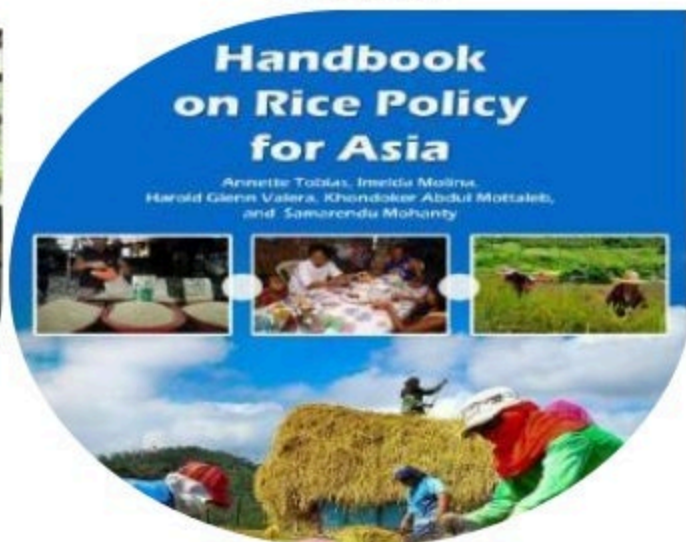
Varieties



Management



Value adding

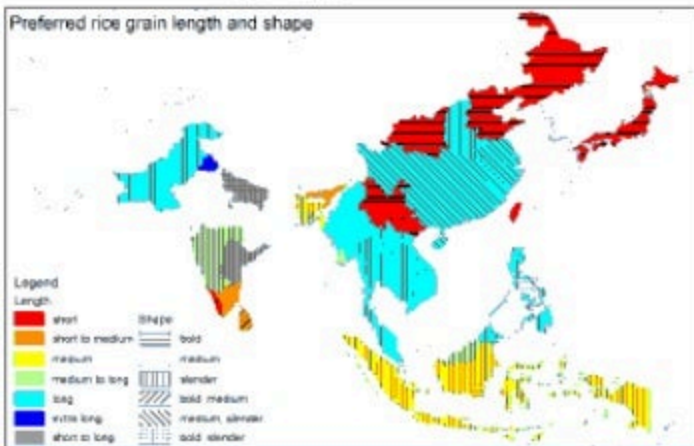
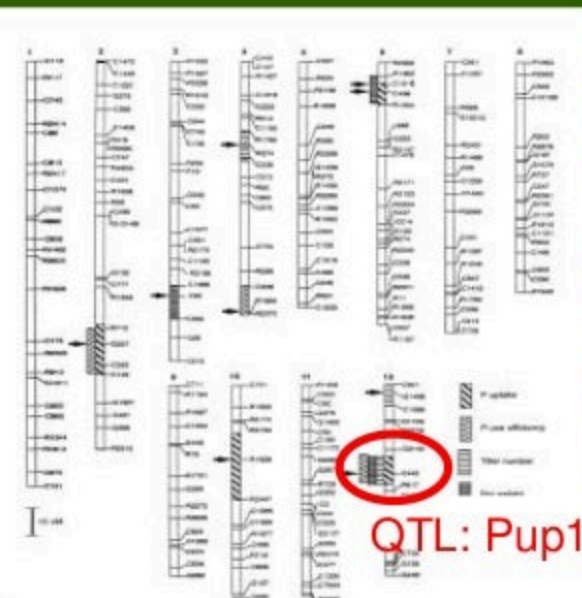


Assessment



Last-mile delivery

Outputs: products and services



GRiSP New Frontier research

Project	PLs	Institutions
Genotyping and phenotyping of African rice species and their pathogens for strategic disease resistance breeding (MENERGEP)	1.2. 1.3. 2.2.	<u>AfricaRice</u> , IRD, JIRCAS, Cirad
Increasing the yield potential in rice using genomic and physiological approaches	2.4.	<u>IRRI</u> , AfricaRice, CIAT, Nagoya U.
Phenomics of key adaptation and yield potential traits - GRiSP Global Rice Phenotyping Network (PRAY)	1.2.	<u>IRRI</u> , AfricaRice, CIAT, Cirad, Embrapa, NIAES, U. Qsld., CAAS, PhilRice
Enhancing the sustainable use of phosphorus through the development of varieties with reduced grain P	2.3.	<u>JIRCAS</u> , IRRI, AfricaRice, Southern Cross U., FOFIFA, Yara
Development of a cutting edge rice transformation platform for complex traits (TALENs)	1.3. 1.4. 2.2.	<u>IRRI</u> , CIAT, U. Minnesota

Global Rice Science Scholarship

Region	Female	Male	Total
Africa	3	6	9
Asia	9	8	17
Europe	1		1
South America	1	3	4
Grand Total	14	17	31

188 applicants from 40 countries
31 awarded for Themes 1-5

Your next
discovery
could be the
answer to
food
insecurity



Apply now for a
2011 Global Rice
Science Scholarship.

A rice scholarship for
scientists pursuing their Ph.D.

Towards GRiSP II

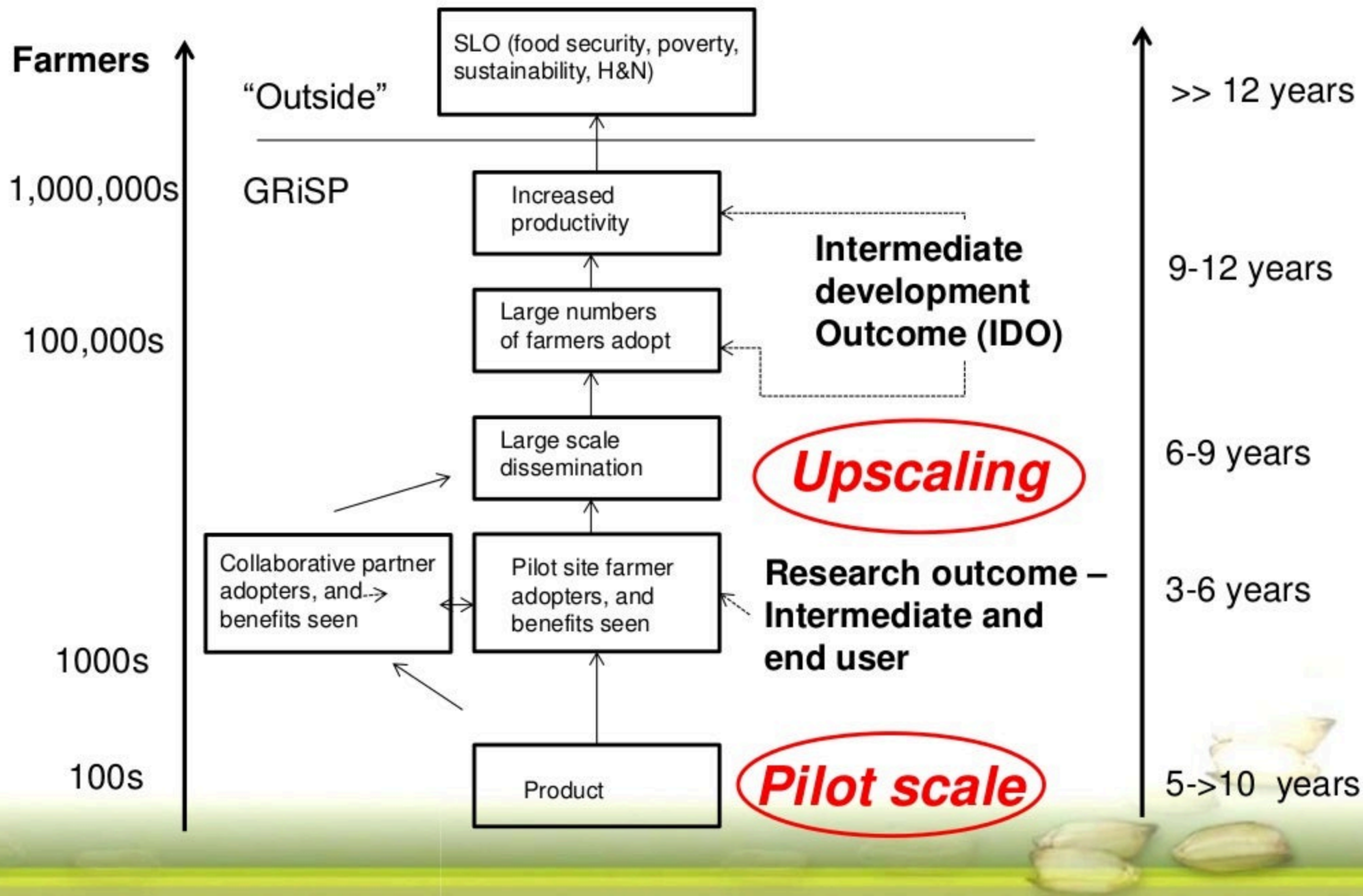
1. Results-Based Management, based on
 - a) Outputs: science-based products and services
 - b) Outcomes: Intermediate Development Outcomes
 - c) Indicators of progress and targets
2. Committed CGIAR funding for delivery
3. Broad Partnerships for “impact at scale”
4. Gender equity and women empowerment
5. Capacity building



Intermediate Development Outcomes

#	IDO	SLOs
1	Increased rice yield	1,2,3
2	Increased rice productivity (resource-use efficiency)	1,2,3
3	Decreased poverty of net rice consumers (urban and rural) and rice producers	1
4	Increased sustainability and environmental quality of rice-based cropping systems	4
5	Improved efficiency and increased value in rice value chain	1,2,3
6	Improved nutrition status derived from rice consumption	3
7	Increased rice genetic diversity for current and future generations	1,2,3
8	Increased pro-poor delivery systems	1-4
9	Increased gender equity in the rice value chain	1,2,3

Schematic Impact Pathway



Schematic IP and Theory of Change

“Outside”

SLO (food security poverty, sustainability, H&N)

Assumptions and risks

Enabling actions

GRiSP

Increased productivity

Assumption: product actually delivers its benefits

See early action at development of improved practice

Large numbers of farmers adopt

Assumption: product responds to a need on large scale; benefits accrue to adopters
Risk: practices are not adopted

Awareness campaigns, demonstration fields, marketing by private sector, penetrate remote areas (identification of target domain – see below)

Large scale dissemination

Assumptions: partners disseminate product; benefits accrue to adopters
Risk: products not adopted

Involvement of partners in product development; capacity building of partners; development of business models; demonstrated benefits to adopters

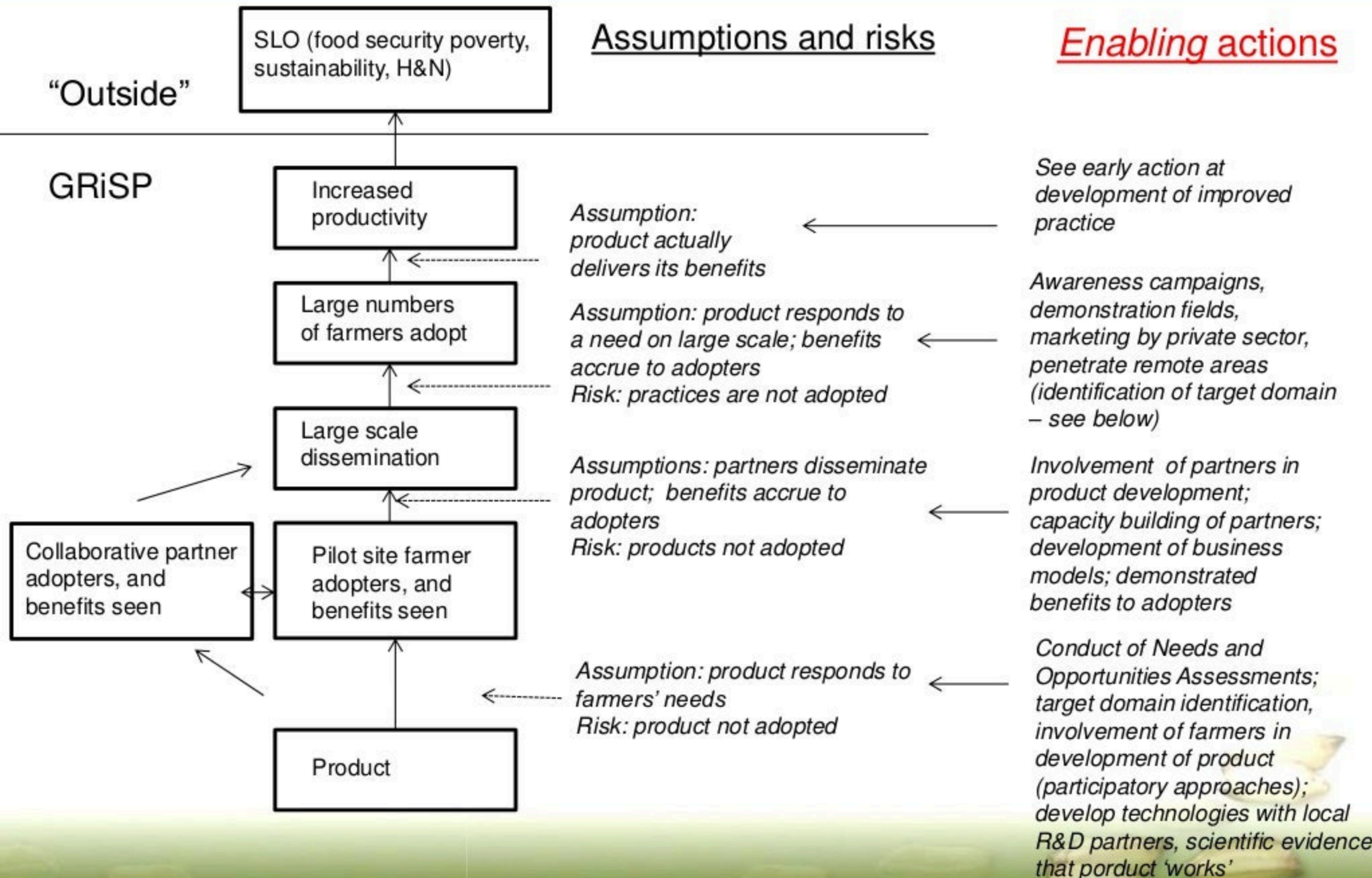
Collaborative partner adopters, and benefits seen

Pilot site farmer adopters, and benefits seen

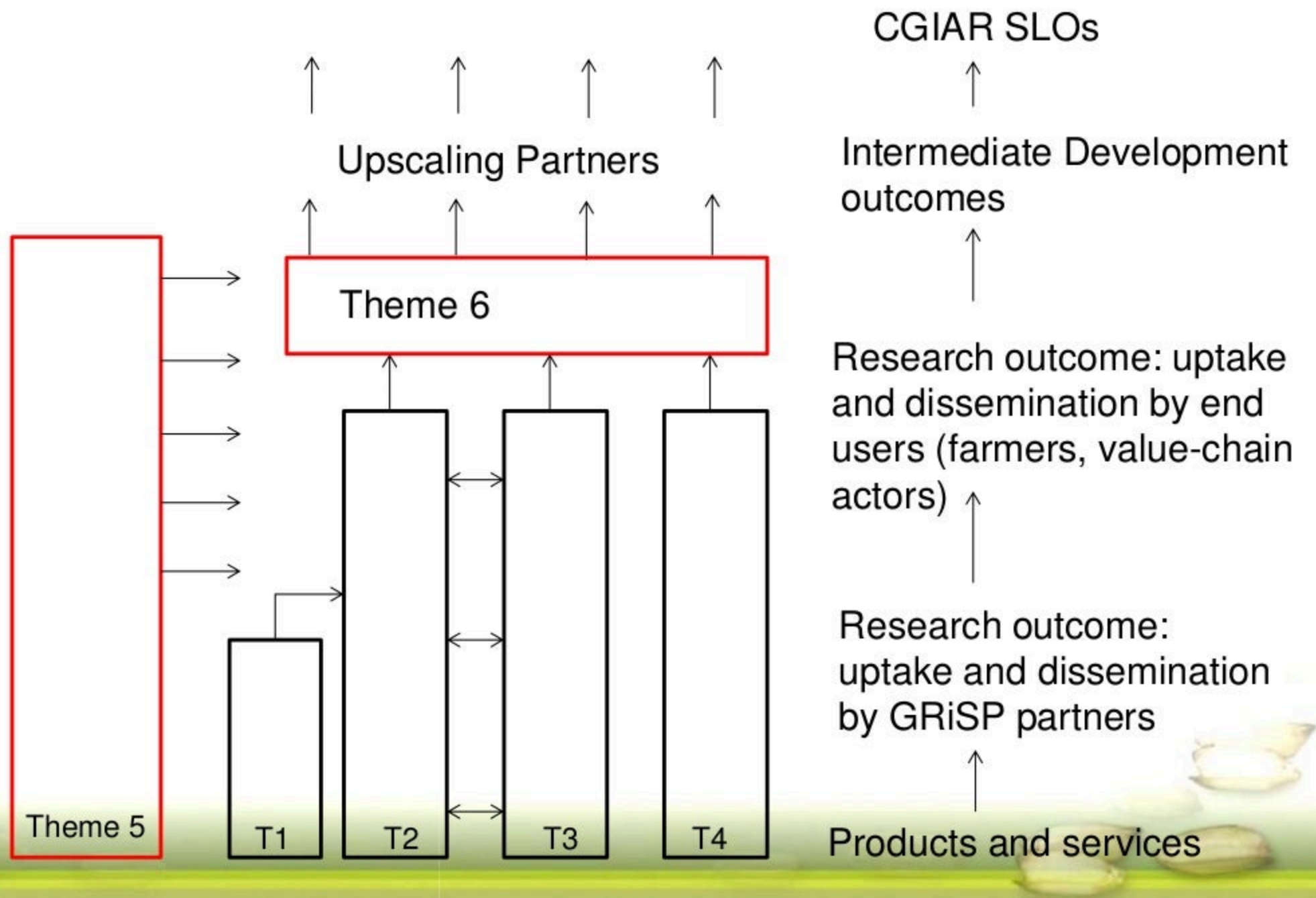
Assumption: product responds to farmers' needs
Risk: product not adopted

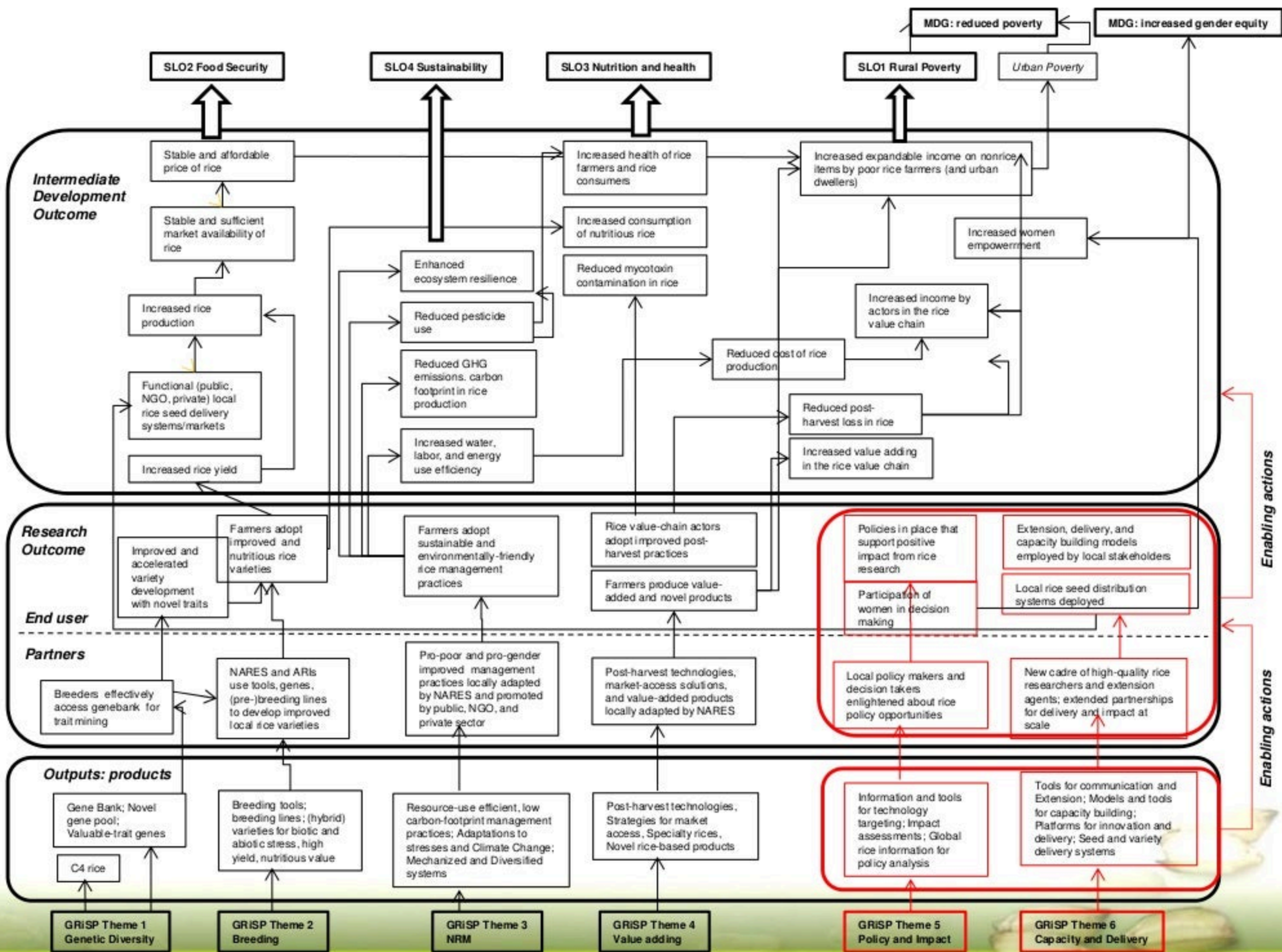
Conduct of Needs and Opportunities Assessments; target domain identification, involvement of farmers in development of product (participatory approaches); develop technologies with local R&D partners, scientific evidence that product 'works'

Product



Coherence for delivery





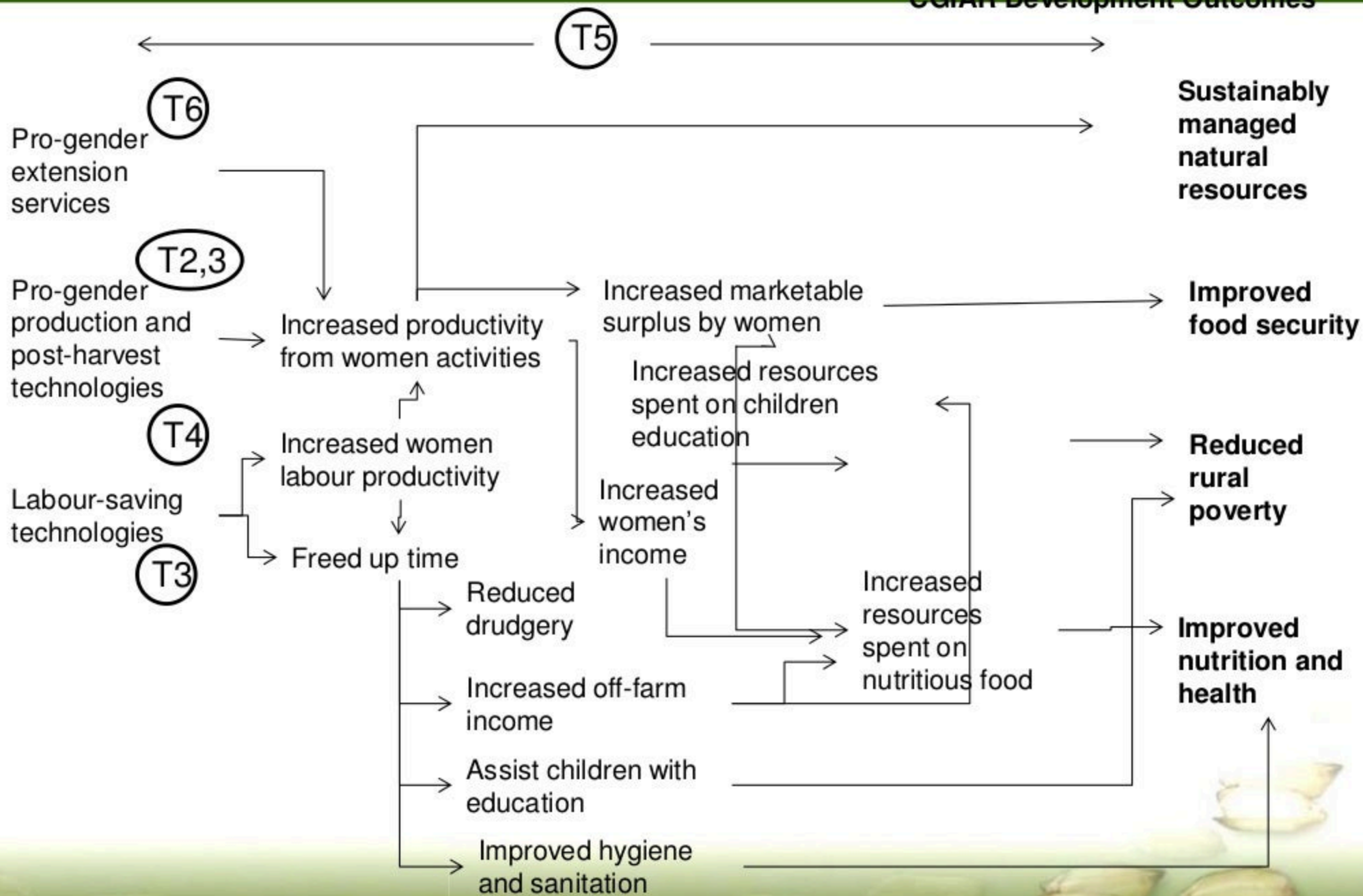
Gender objectives

- *Gender research:* Assess social and gender issues in the rice sector, gender-differentiated impact of GRiSP's products and services on productivity, livelihoods, nutrition, health and sustainable natural resources management (*Theme 5*)
- *Gender mainstreaming:* Ensure that the development of GRiSP 's products and services takes gender differences into account and addresses the specific needs and preferences of women (*Themes 2,3,4,6*)
- *Gender capacity enhancement:* Enhance the capacity of women to participate in planning, execution, monitoring and evaluation of research, extension and provision of advisory services, and development (*Theme 6*)



GRiSP Gender impact pathway

CGIAR Development Outcomes



Capacity Building

Aging cohort of scientists: graduate (under, post) scholarships (GRISS)

Retooling of advisory services.

1. New landscape: public extension services, private sector, NGOs, etc
2. New tools: ICT
3. New knowledge

Tooling farmers as modern entrepreneurs

Tooling value-chain businesses



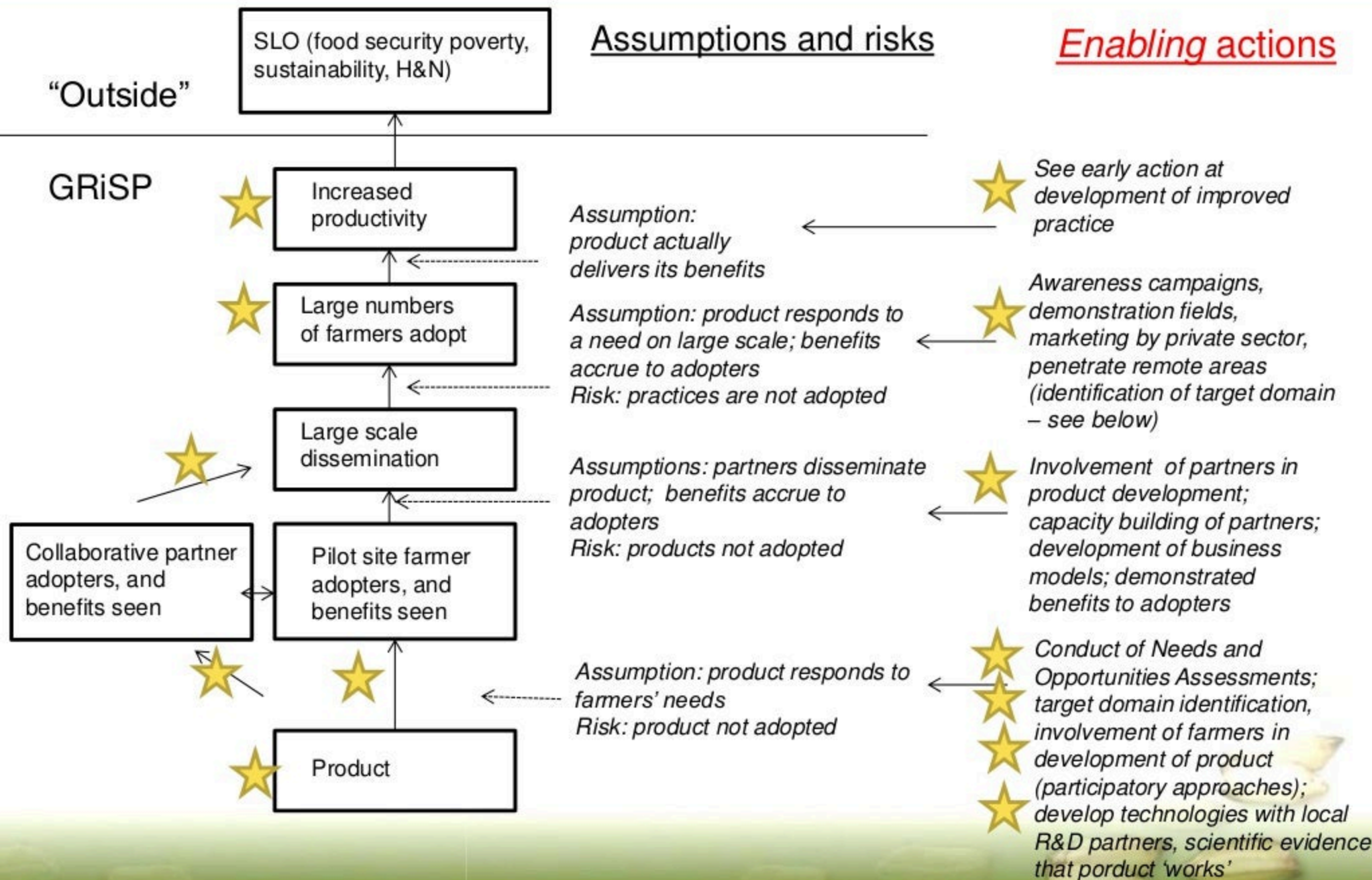
Attribution and Contribution

1. Attribution: “full-blown” impact assessment with control groups and counterfactuals
2. Contribution: credible evidence that all links in the impact pathway have been addressed (theory of change)
 - i. Products, services
 - ii. Enabling environment

=> Indicators of progress

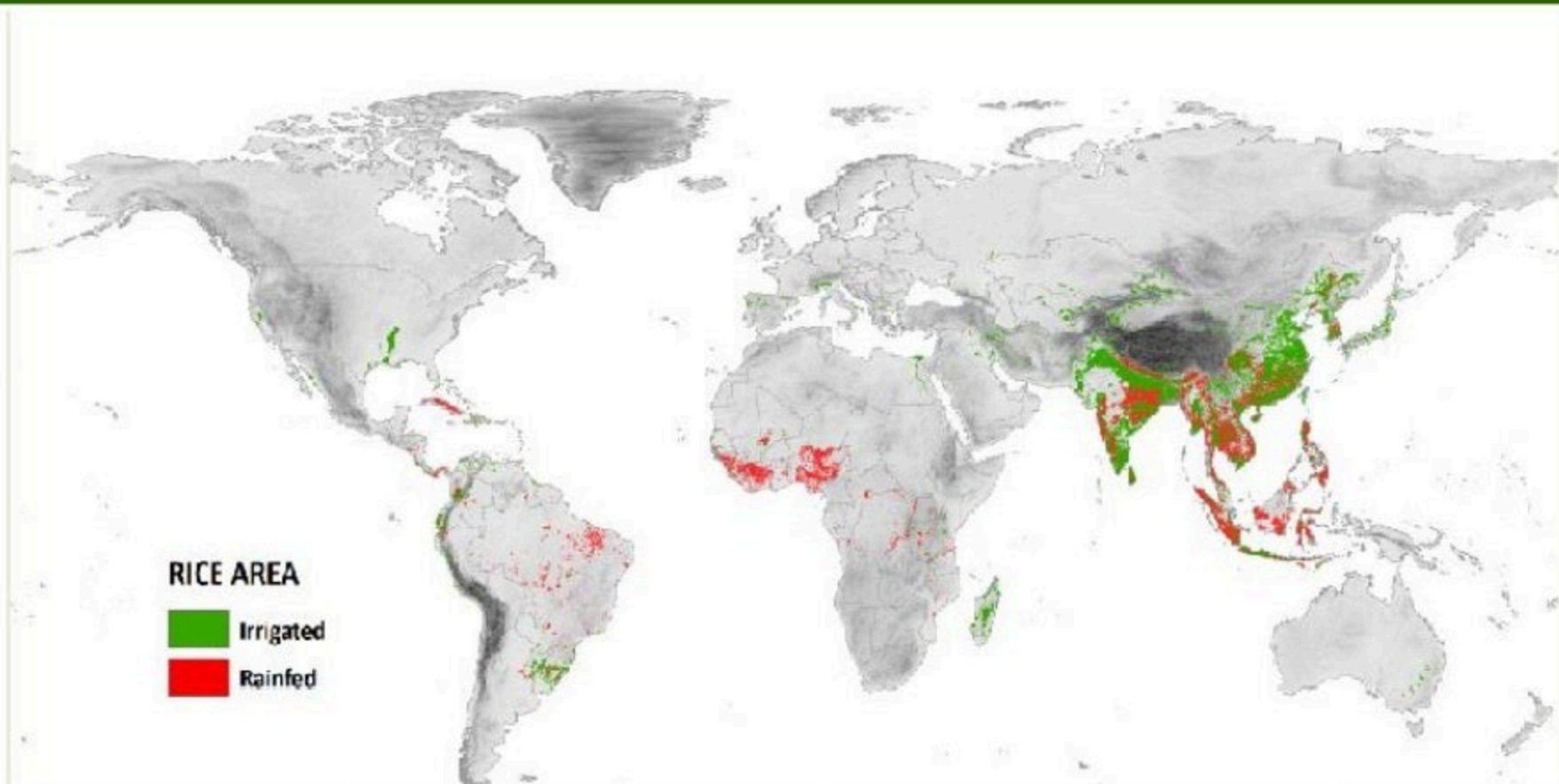


Evidence of progress



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Global Rice

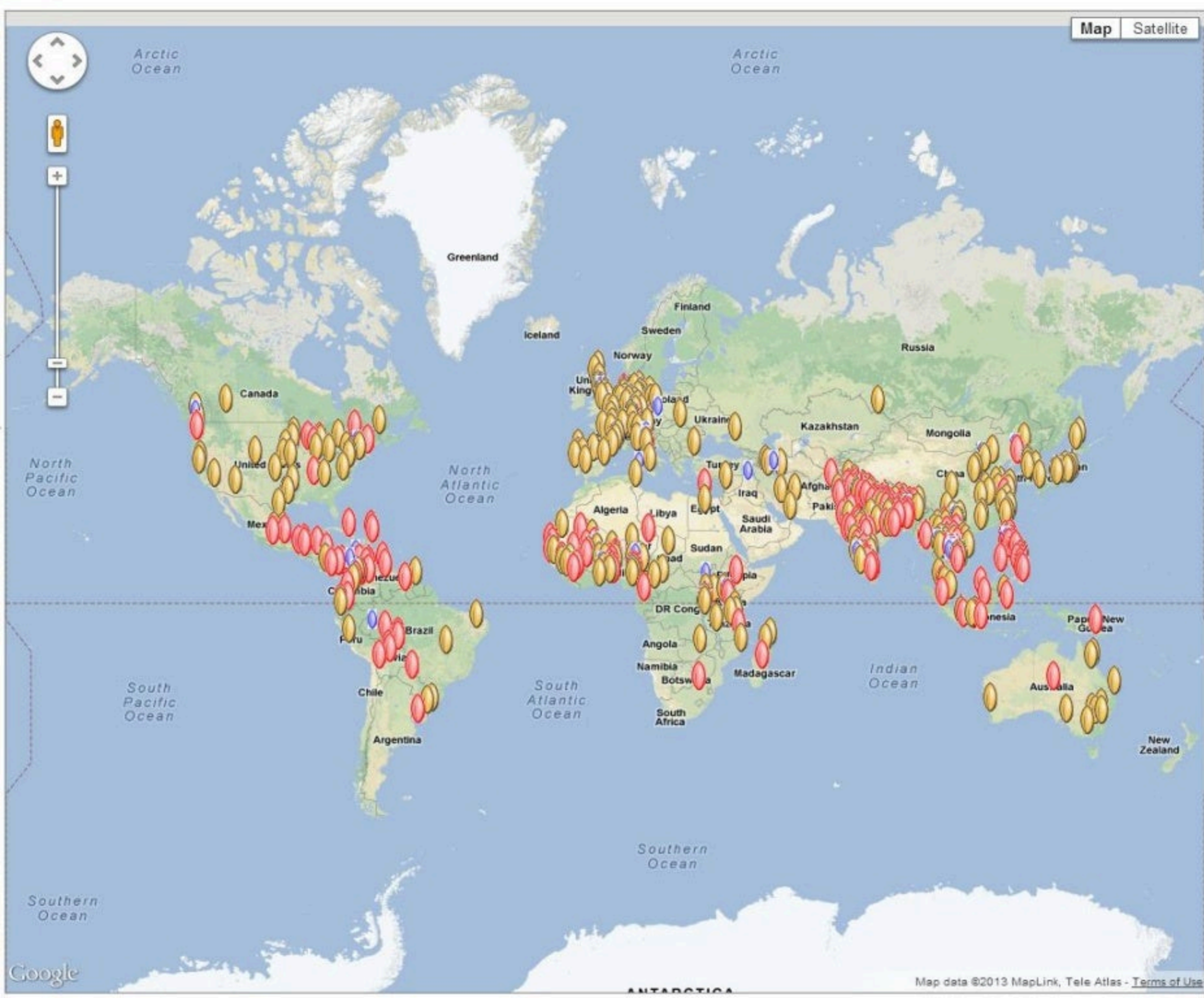


	Harvested Area (M ha)	Production rough rice (M t)	Yield rough rice (t/ha)
World	154	672	4.4
Asia	137	607	4.5
Latin America	6	25	4.5
Africa (SS)	9	23	2.5
Rest of World	3	17	6.7



Map Satellite

- Legend:**
- Research
 - Development
 - Others



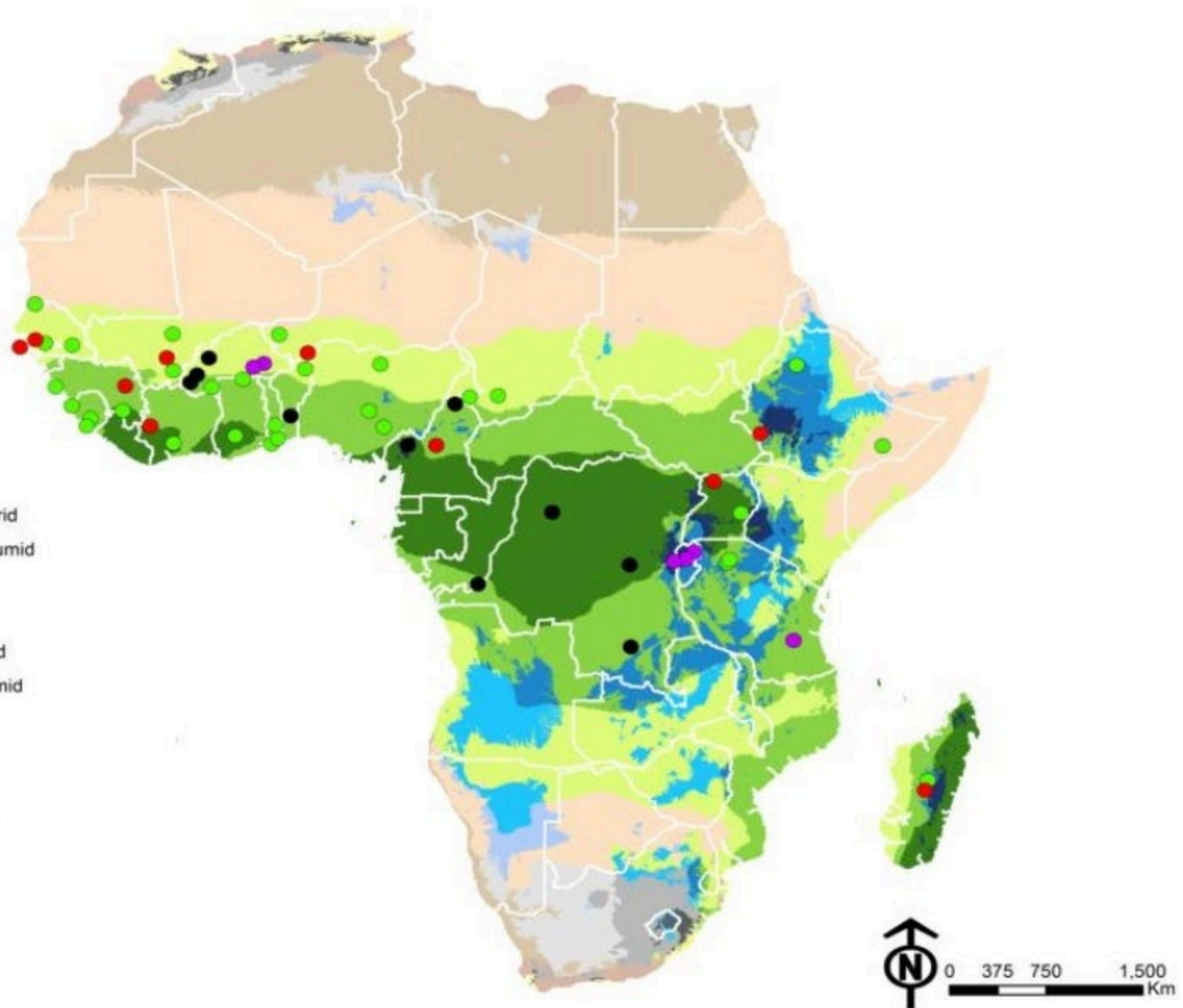
Rice Sector Development Hubs

Ecology

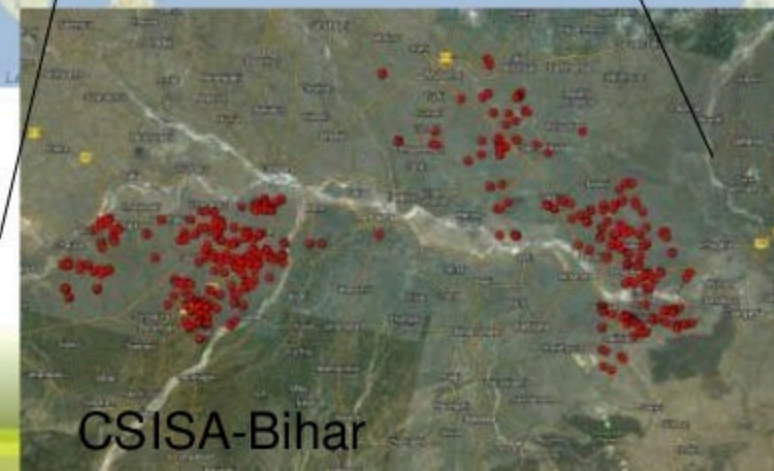
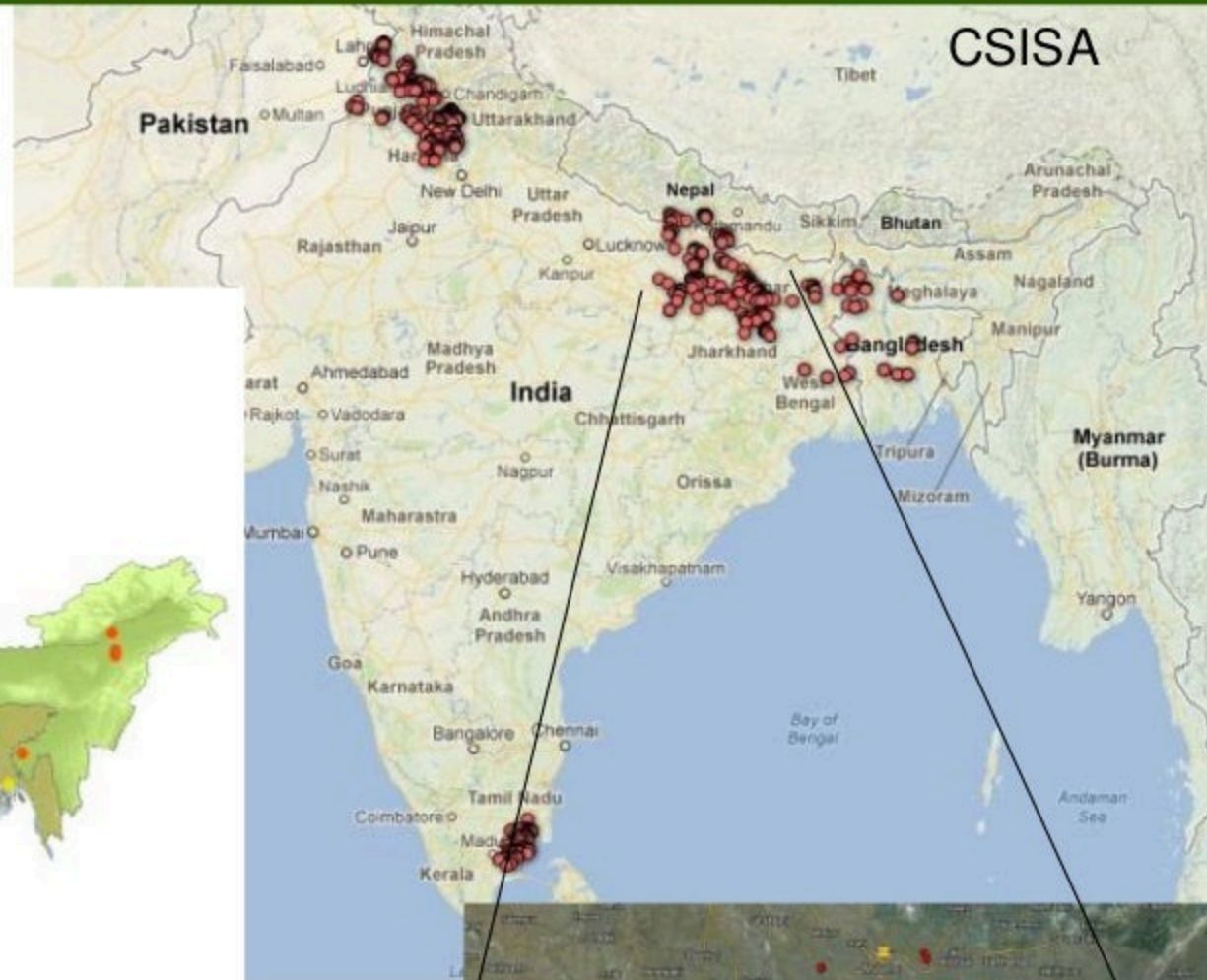
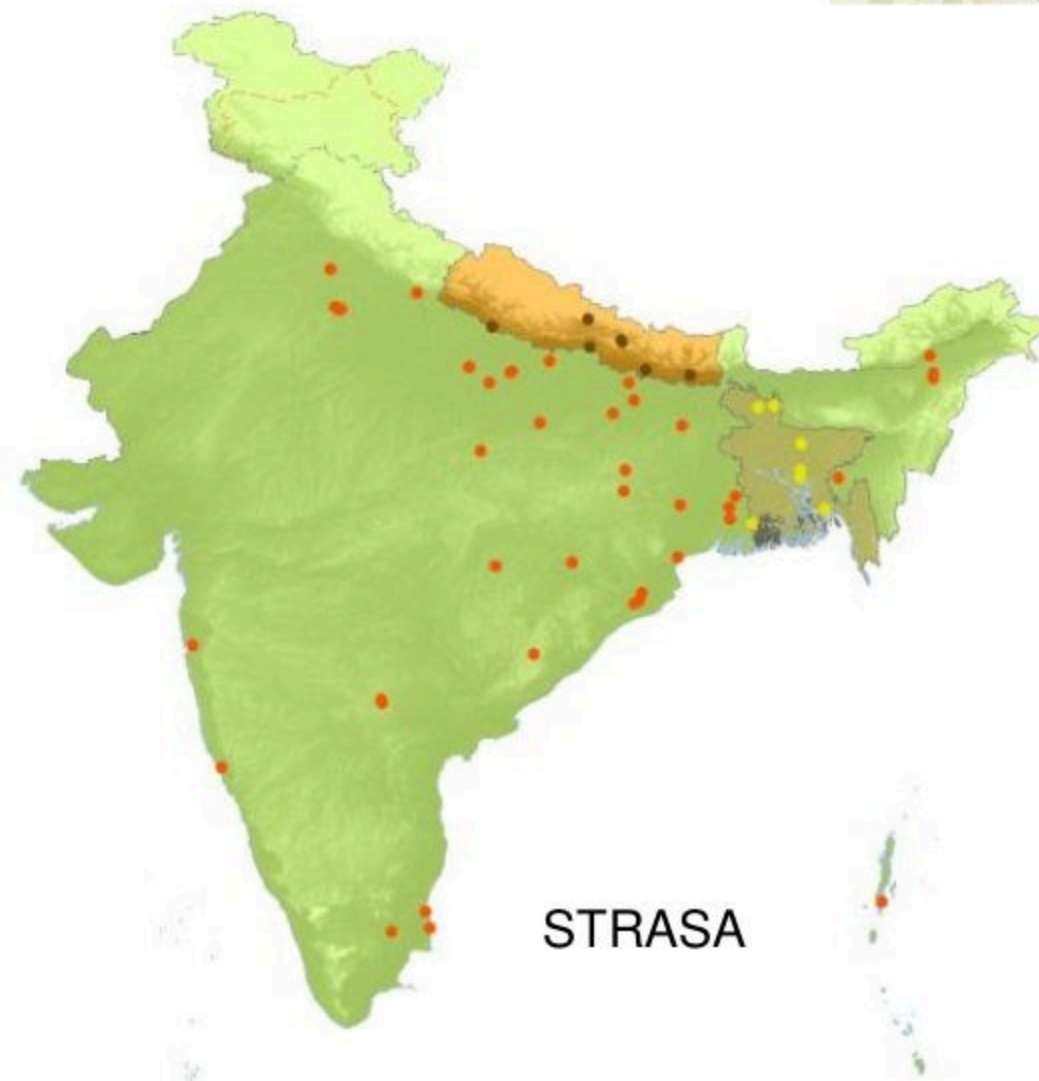
- Irrigated
- Lowland
- Upland
- Upland & Lowland

Agroecological Zones

- Sub-tropical - warm / arid
- Sub-tropical - warm / semiarid
- Sub-tropical - warm / sub-humid
- Sub-tropical - warm / humid
- Sub-tropical - cool / arid
- Sub-tropical - cool / semiarid
- Sub-tropical - cool / sub-humid
- Sub-tropical - cool / humid
- Tropical - warm / arid
- Tropical - warm / semiarid
- Tropical - warm / sub-humid
- Tropical - warm / humid
- Tropical - cool / arid
- Tropical - cool / semiarid
- Tropical - cool / sub-humid
- Tropical - cool / humid



South Asia



Red de Mejoramiento del FLAR



Diverse priorities

- South Asia: deep poverty, hunger, CC
 - Stress environment (drought, salinity, submergence); home food security; stress tolerance, risk
 - Irrigated environment: yield, national food security, export
- Vietnam: export, quality, value chain, reduced environmental footprint, labeling
- Philippines: self sufficiency, yield
- Myanmar: 'everything'
- SSA: import substitution, yield, quality, value chain
- Latin America
 - temperate; export, quality, reduced environmental footprint
 - Tropical: yield, home food security, poverty



Global vs Regional targets

Global Intermediate Development Outcomes and targets

- Global food security -> improved markets and affordable market price, trade flows, sustainability criteria (SRP) and value chains
- Global poverty alleviation, eg in mega-cities outside rice-production area

Regional/national Intermediate Development Outcomes and targets



Partners for development outcomes

*The realization of IDOs is, however, not under control of the CRPs and depends on multiple, often iterative steps conducted by other players and necessarily with substantial additional investment (**typically 10 x**). While the CRPs are accountable for their outputs and have some control over the near-term adoption and use of their research results, the development outcomes occur, particularly at scale, as a result of activities, policies and investments outside the CGIAR [CRP]*"

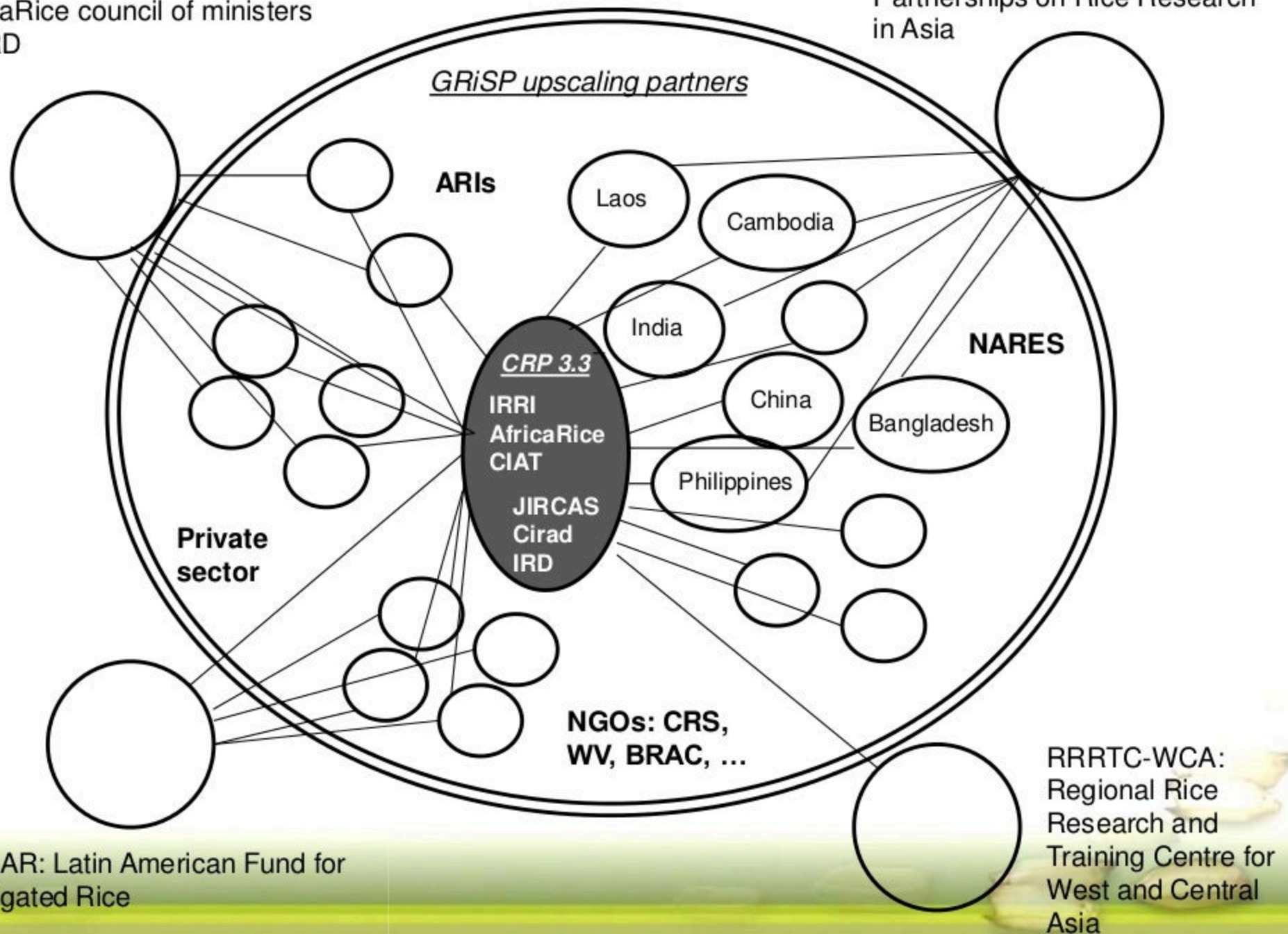


CRP 3.3 and GRiSP

GRiSP

AfricaRice council of ministers
CARD

CORRA: Council for
Partnerships on Rice Research
in Asia



Distributed funding

GRiSP

CORRA: Council for Partnerships on Rice Research in Asia

AfricaRice council of ministers
CARD

GRiSP upscaling partners

ARIs

CGIAR: W 3
Bilateral (75%)

Lac

India

CGIAR: W 1,2
(25%)

IP 3.3

AfricaRice
CIAT

JIRCAS
Cirad
IRD

China

NARES

Bangladesh

Philippines

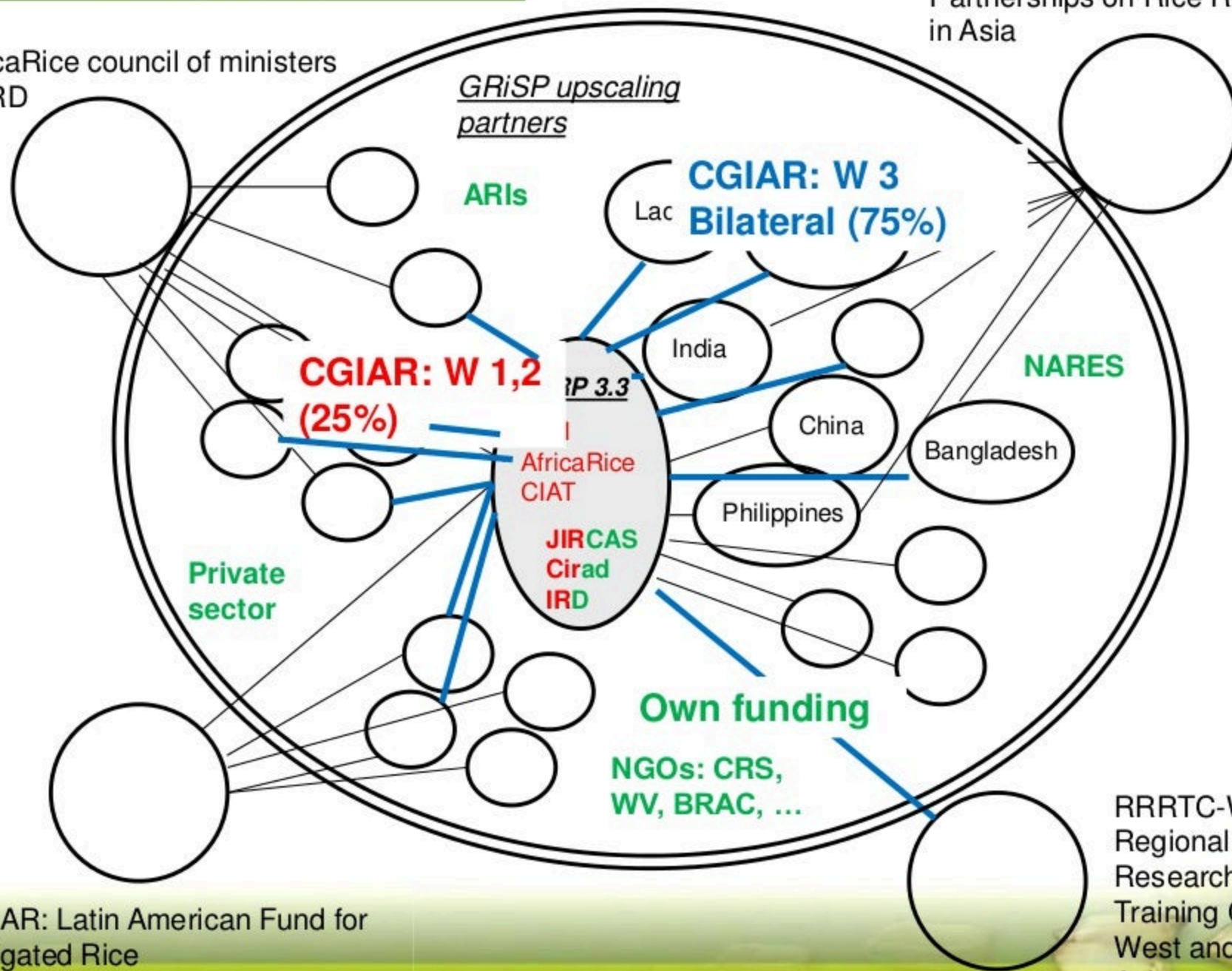
Private sector

Own funding

NGOs: CRS,
WV, BRAC, ...

FLAR: Latin American Fund for
Irrigated Rice

RRRTC-WCA:
Regional Rice
Research and
Training Centre for
West and Central
Asia



Results-Based Financing CRP 3.3

Minimum commitment 55 M \$/y from W1,2 CGIAR for:

1. Research and Product development CGIAR centers IRRI, AfricaRice, CIAT (40 M)
2. Partnerships
 - a) GRiSP network support to partners (1 M)
 - b) Discovery Research (5 M)
 - c) Upscaling products and services (5 M)
 - d) Boosting gender-equity outcomes (2 M)
 - e) Capacity building/GRISS (2 M)

W3 and bilateral grants to CRP 3.3/CGIAR Centers complement above activities



Fast-tracking RBM in GRiSP I

2014-2015: develop and put in place a SMART system of indicator collection, aggregation, analysis and evaluation; target setting and implementation with partners, training

Regional: in key target areas: surveys (tablets), measurements, local statistics and data bases
Global: aggregation and synthesis of the above, (inter)national databases, modeling, RS, GIS

Rough cost: 5 M\$



*“A US\$ 20
investment in
GRiSP will lift
one person out
of poverty.”*



CGIAR Thematic Area 3:

Sustainable crop productivity increase for global food security

A CGIAR Research Program on Rice-Based Production Systems

November 2010

Global Rice Science Partnership (GRiSP)



IRRI



AfricaRice

CIAT

Centro Internacional de Agricultura Tropical
International Center for Tropical Agriculture
Centro Internacional de Agricultura Tropical

An evolving international alliance with Cirad, IRD, JIRCAS, and hundreds of
research and development partners worldwide

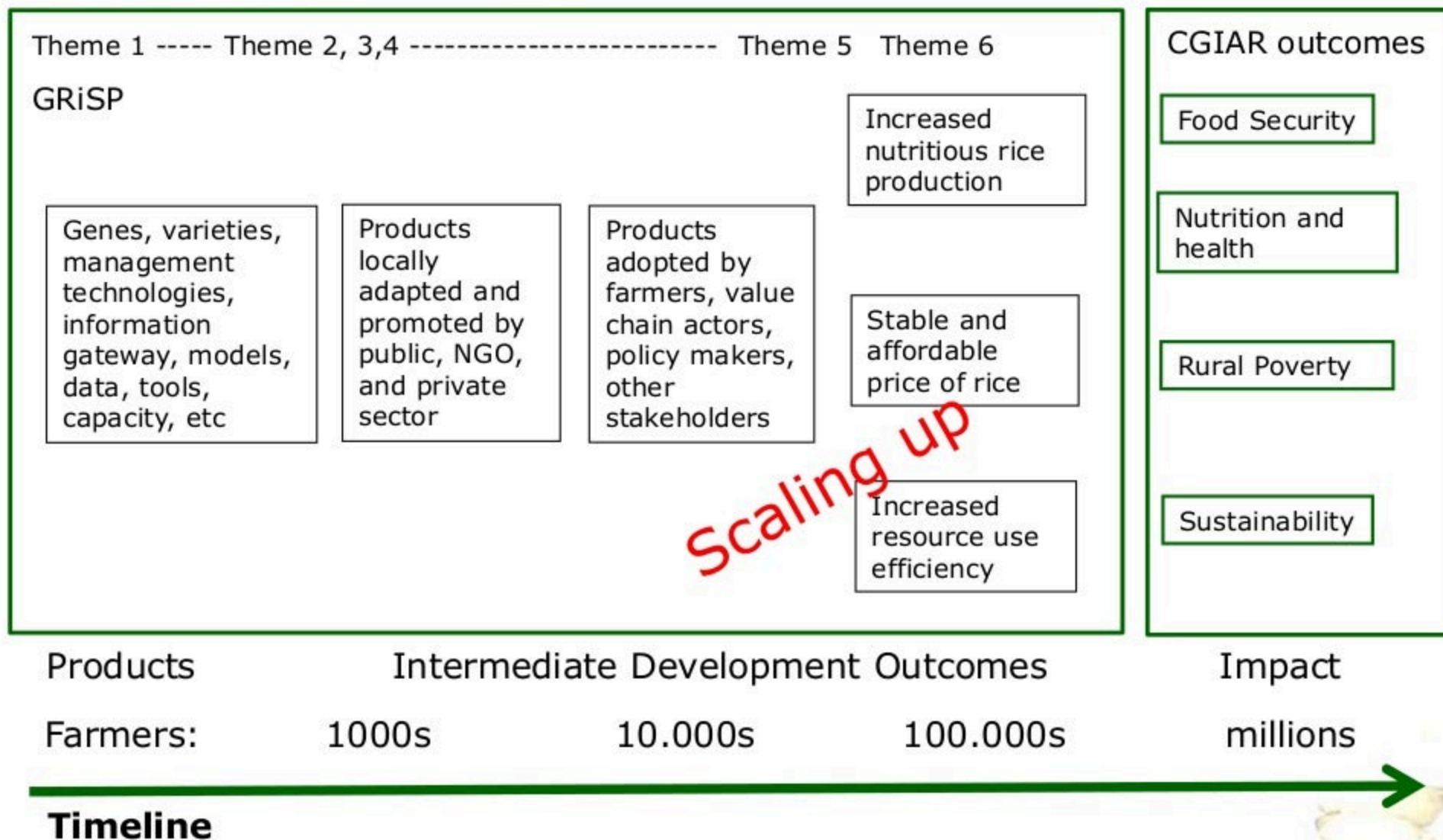
<http://www.grisp.net>

Thanks for your attention



Science partnerships

Development partnerships



GRiSP Objectives

- To increase rice productivity through development of improved varieties and other technologies along the value chain
- To foster more sustainable rice-based production systems that use resources more efficiently
- To improve the efficiency and equity of the rice sector through better and more accessible information and strengthened delivery mechanisms ("enabling environment")



GRiSP research themes

1. Conserving genetic diversity; gene discovery
2. Development of improved varieties
3. Sustainable management practices
4. Value adding (post harvest, new products)
5. Technology targeting and policy
6. Partnerships for large-scale impact, capacity building)



Outputs: products and services

Product Line 3.1. Future management systems for efficient rice monoculture

Product 3.1.1. Strategies to increase water use efficiency

Product 3.1.2. Principles and tools for site-specific nutrient management

Product 3.1.3. Management options for pests, weeds, and diseases

Product 3.1.4. Integrated Good Agricultural Practices (GAP)

Product Line 3.2. Resource-conserving technologies for diversified farming systems

Product 3.2.1. Diversified cropping systems in Asia

Product 3.2.2. Mechanization and conservation agriculture

Product Line 3.3. Management innovations for poor farmers in rainfed and stress-prone areas

Product 3.3.1. Management options for drought, submergence, and salinity

Product 3.3.2. Management options for pests, diseases, and weeds

Product 3.3.3. Mechanization and Conservation Agriculture for low-input and upland systems

Product 3.3.4. Land and water development options for inland valleys

Product Line 3.4. Increasing resilience to climate change and reducing global warming potential

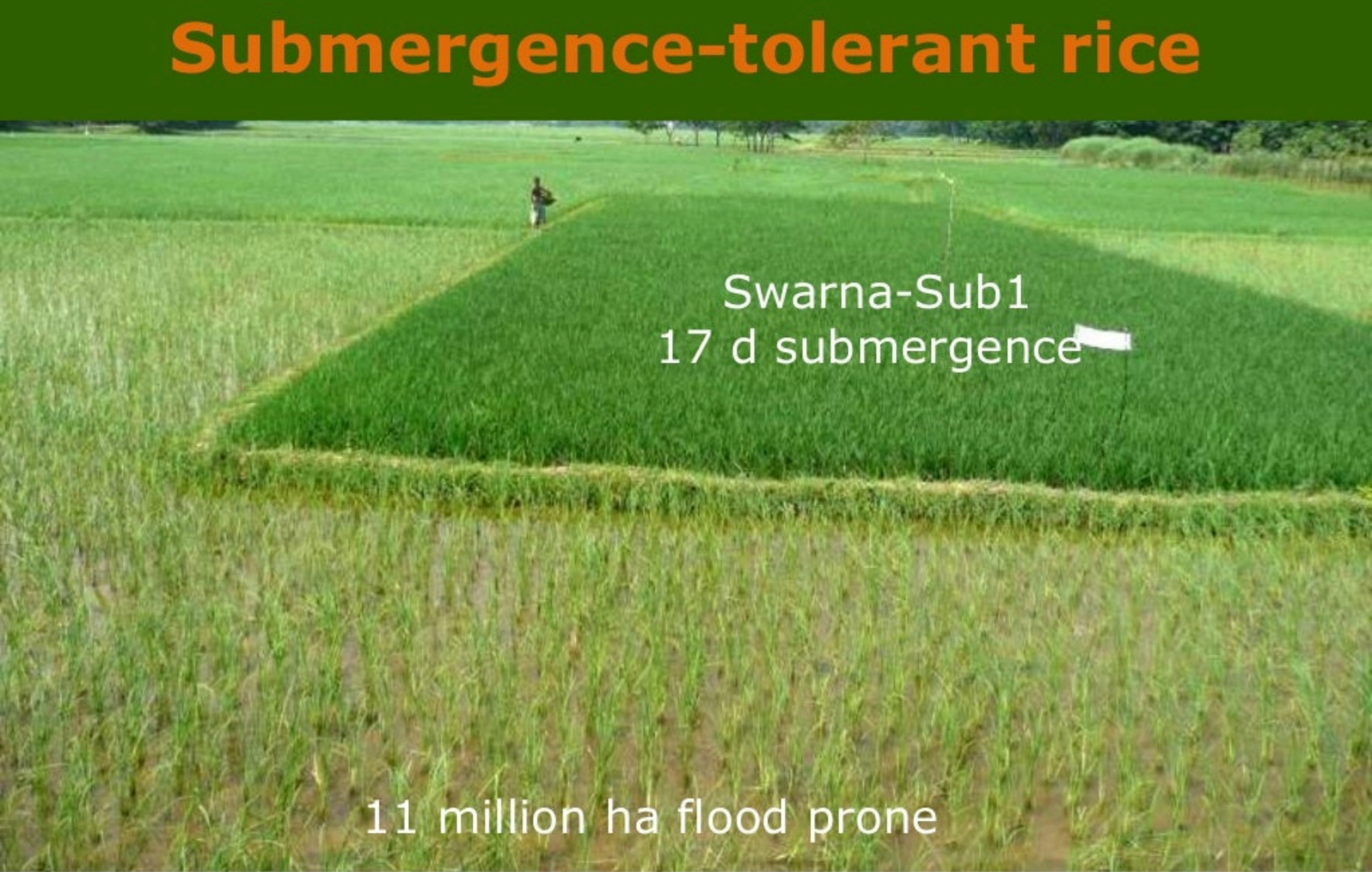
Product 3.4.1. Assessment tools (ecological resilience, impact of climate change, adaptive value of response options)

Product 3.4.2. Field management technologies to reduce green-house gas emissions

Product 3.4.3. Strategies to adapt to climate change and increase resilience



Submergence-tolerant rice



Swarna-Sub1
17 d submergence

11 million ha flood prone

> 25 years of 'discovery science': gene, markers,...



Farmers' submergence tolerant landraces collected; FR13A

Gene bank screened; FR13A identified

Semi-dwarf & submergence tol. combined

First high-yielding dwarf varieties

1950

1978

1990

2000

2010

1995: *Sub1* mapped to Chr. 9

Fine mapping & marker development initiated

2002: Swarna crossed with IR49830-7 (*Sub1*)

2006: *Sub1-A* gene conferring submergence tolerance

2006: Swarna-Sub1 developed by marker assisted backcrossing

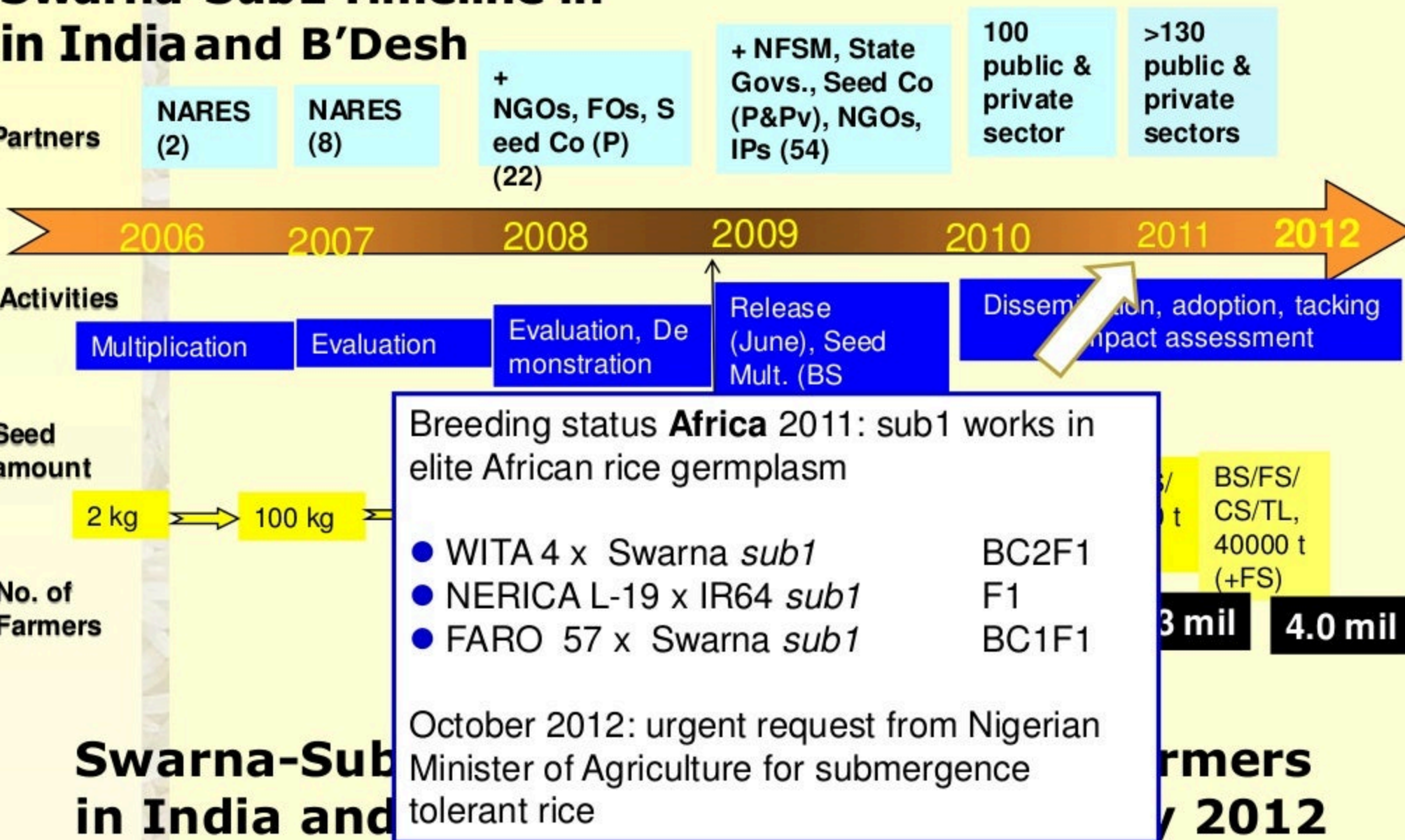
2008: *Sub1-A* mode of action: inhibit response to GA

2009: Swarna-Sub1 released in Indian, Indonesia, IR64-Sub1 in Indonesia, Philippines

2010: Two *Sub1* varieties released in Bangladesh



Swarna-Sub1 Timeline in India and B'Desh



New Products: "2 in 1"

Submergence + salinity tolerance

12 million ha salt affected

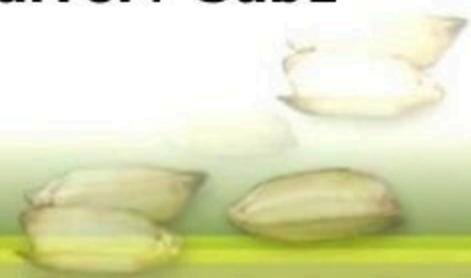


**10 days submerged
in saline water**



Sub1 only

SalTol+ Sub1



GRiSP Objectives

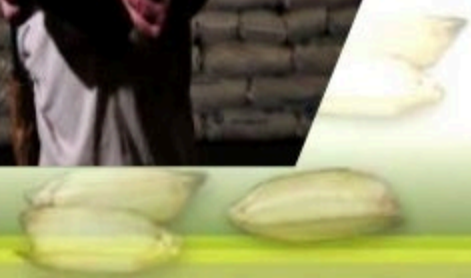
Productivity



Sustainability



Efficient sector



Irrigated Rice research Consortium

- 9 India
- 10 Bangladesh
- 3 Sri Lanka



131 partners

Consortium for Unfavorable Rice Environments



Myanmar

