



Research
Program on
Rice
Global Rice
Science
Partnership

GRiSP – Africa 2012 Accomplishments

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GRiSP Global Science Forum
8-9 November 2012, CARD Meeting Yaounde, Cameroun



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Contents

- Working towards impact
- Highlights
- Looking ahead



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Boosting Africa's Rice Sector
A research for development strategy 2011-2020

Figure 1: Africa's annual demand for rice

Region	2011 (Million tonnes)	2020 (Million tonnes)
East Africa	10.0	12.0
West Africa	15.0	18.0
North Africa	2.0	2.5
South Africa	1.0	1.2

Figure 2: Number of people that stand on the PIP's 2020 priority list among farmers and processors by region

Region	Number of people
East Africa	150,000
West Africa	200,000
North Africa	50,000
South Africa	20,000

Figure 3: Areas covered by research on farmer groups by 2020 in PIP 2011-2020

Region	Percentage of areas
East Africa	30%
West Africa	40%
North Africa	10%
South Africa	20%

Figure 4: Number of people in one training workshop in 2011-2012

Region	Number of people
East Africa	100
West Africa	150
North Africa	50
South Africa	20

Figure 5: Areas covered by researcher visits by 2020

Region	Percentage of areas
East Africa	25%
West Africa	35%
North Africa	15%
South Africa	25%

Figure 6: Number of papers in publishing

Region	Number of papers
East Africa	10
West Africa	15
North Africa	5
South Africa	2

Logos: AfricaRice, CGIAR, Research Program on Rice, Global Rice Science Partnership

Science for Impact

What is needed?

- Critical mass
- Connect actors (R <-> R; R <-> D <-> P)
- Concentrate efforts (avoid dispersion)
- Communicate results

How?

Mechanism 1: Global Rice Science Partnership

Priority area (PA)	GRiSP (Theme)	Water and Land	CCAFS	Non CRP
1 Genetic diversity and improvement	1 + 2			
2 Yield gap closure, intensification and diversification	3		X	
3 Sustainable expansion		X	X	
4 Value chain development	4			
5 Policy and targeting	5			
6 Rice sector development	6			X
7 Capacity building	Cross-cutting			X



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Mechanism 2: Task Forces



- Breeding
- Agronomy
- Processing and value-addition
- Gender
- Policy

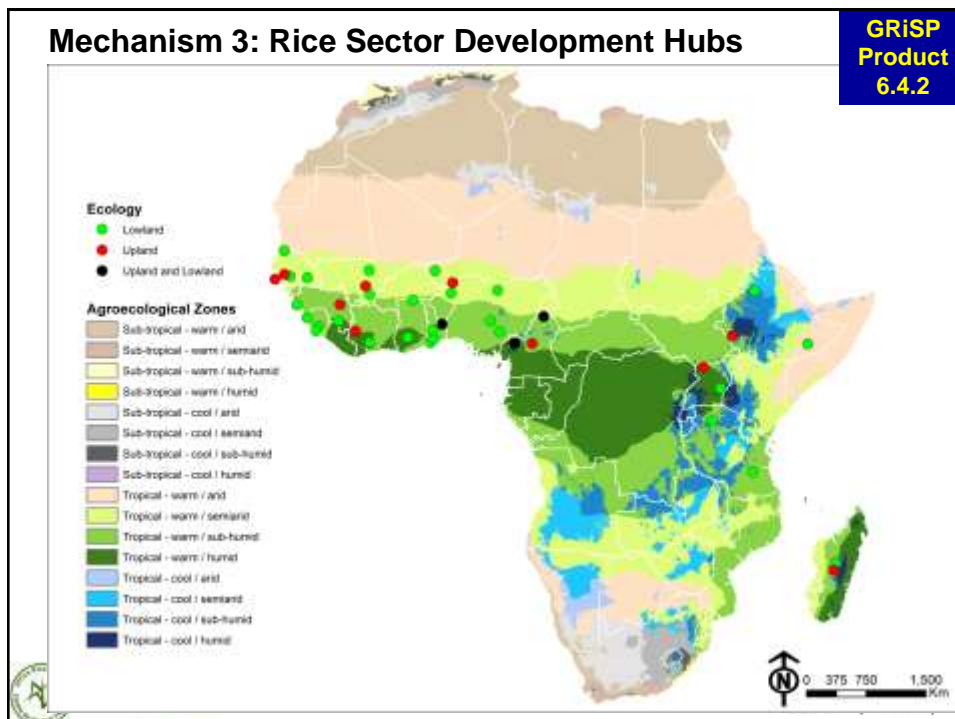
‘Collective research for development efforts on critical thematic areas in the rice sector, based on the principles of sustainability, build-up of critical mass and ownership by the national research systems’



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Science for Impact

What is needed?

- Critical mass
- Connect actors (R <-> R; R <-> D <-> P)
- Concentrate efforts (avoid dispersion)
- Communicate results

How?

- CRPs; AfricaRice leads for GRiSP in Africa
- 'Rice Task Forces'
- Network of 'rice sector development hubs'
- Awareness raising (AfricaRice's Council of Ministers, NEC meetings...)



Contents

- Working towards impact
- **Highlights**
- Looking ahead



2012 AfricaRice Science Week and GRiSP-Africa Science Forum



Total of 161 participants from regional and national partners (29), IRRI (6), IRD (10), CIRAD (4), JIRCAS (9), Institute of Development Studies (IDS, UK) (1), other CGIAR centers in Cotonou (3), the media (8), and AfricaRice (90).



GRiSP Themes 1 and 2: Genetic diversity and improvement

<p>Germplasm</p> <ul style="list-style-type: none"> ● Conservation ● Trait identification ● Data management 	<p>Pre-Breeding</p> <ul style="list-style-type: none"> ● Trait/Gene identification ● Marker development 	<p>Breeding</p> <ul style="list-style-type: none"> ● Trait incorporation ● Marker assisted selection ● Conventional selection ● Line Development 	<p>Evaluation</p> <ul style="list-style-type: none"> ● Multi-site, multi-year, evaluation ● Key site, NARS <ul style="list-style-type: none"> ● PVS ● INGER 	<p>Variety Release System Seed Production System</p>	<p>New Variety</p> <p>Each Region, Country</p>
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GRiSP
 Products
 1.3.5, 2.2.2,
 1.3.4

New QTLs Identified

- AfRGM resistant QTL of both *O. sativa* and *O. glaberrima*
 ITA306 x Tos145-19 , ITA306 x Tog7106 genotyped with ca 300 SNP markers and SSR as well. A QTL with strong effect identified in both.
- BLB resistance
 New resistant gene, *xa/B3*, identified.
 The resistance is effective to **5 strains in West Africa tested.**
- Cold tolerant QTL
qRCTb6, for cold tolerance derived from Kunmingxiobaigu, is under fine mapping.

GRiSP Products
 2.3.2, 2.3.3, 2.2.3

New Sources of Tolerant Germplasm

- **AG Tolerant *O. glaberrima***
 Out of 2000 *O. glaberrima*, accession tolerant to 15 cm water depth identified (Acc 764, 1941, 1629)
- **Fe toxicity tolerant *O. glaberrima***
 Out of 500 *O. glaberrima*, lines tolerant in terms of yield in hotspot identified (TOG6635, IRGC102262 etc)

IRGC102514
- **Germplasm resistant to stem borer**
 LAC 23, CG 14, NERICA 14, WAB 1159 identified as resistant to rice stem borers

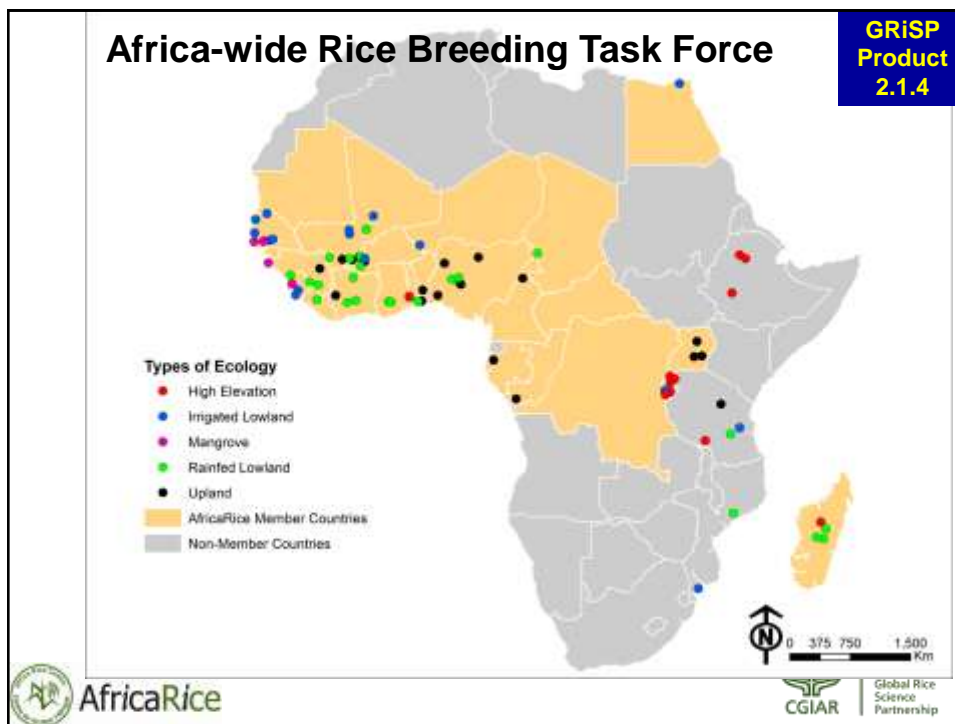
WAB 1159-2-12-11-6-9-1-2

MAS for Disease Resistance					GRiSP Products 2.2.2, 2.3.3	
Trait	Donor	Recipient	Locus	2011	2012	
RYMV1 resistance	Gigante	IR64, IR47, Sahelika, FKR28	<i>rymv 1-2</i>	BC3F5	BC3F6	
	Gigante, NIL 2, 16, 54, 130	WITA4, Bouake189, ITA306, NERICA L19, Saro5, IR64	<i>rymv 1-2</i>	Parent	BC1F1	
	<i>O. glaberrima</i> TOG5681	Saro , Supa	<i>rymv1-3</i> New	Parent	BC1F1	
RYMV 1 and 2 resistance	<i>O. glaberrima</i> (Acc104586)	NERICA L19, NIL 130	<i>rymv 1 -2</i> and <i>rymv 2</i>	F1	F2	
Blast resistance	Owarihata mochi	IR64, NERICA L19, Sahel 108, Kogoni, Rassi, IR31785	<i>pi21</i>	F1	BC2F1	
	Modan		<i>PB1</i>	F1	BC2F1	



MAS for Abiotic Stress Tolerance					GRiSP Products 2.3.2, 2.3.1, 2.3.4, 2.3.3	
Trait	Donor	Recipient	Locus	2011	2012	
Salt tolerance	FL 478	Rassi	<i>saltol</i>	BC3F2	BC3F3	
	Pokkali	Sahel 108	<i>saltol</i>	BC2F1	BC2F3	
Submergence tolerance	Swarna sub 1	WITA 4	<i>Sub 1</i>	BC2F1	BC3 F2	
	IR64 sub1	NERICA L19	<i>Sub 1</i>	F1	BC1	
	Swarna sub 1	TOX4004, Kogoni, FARO44, BW 348-1	<i>Sub 1</i>	F1	F2	
Drought tolerance (Lowland)	Apo, IR77298-14-1-2-10	WITA4, NERICA L19, FARO44	<i>DTY3.1</i> <i>DTY8.1</i> <i>DTY2.1</i> <i>DTY2.2</i>	F1	F2	
Cold tolerance	Silewah	NERICA L19, Sahel 108	<i>ctb1, ctb 2</i>	BC1F1	BC1F2	
P-deficiency tolerance	Kasalath	NERICA 1, 4, 10, WAB96, WAB515, Dourado precoce	<i>Pup 1</i>	Pup1 survey F1	BC1F1	





Promising breeding lines close to release



**GRiSP
Theme 2
All Products**

Ecology	Traits	Number	Status	Country
Upland	Drought	11	PVS	Benin, Burkina Faso, Mali, Nigeria
		3	DUS	Uganda
		3		Burkina Faso, Guinea Conakry
Irrigated	Cold	16	PVS	Senegal, Mali
	Fe toxicity	6	PVS	Burkina Faso (WAT1046, WAS20BB, SIK9-164)
	RYMV	4		Mali
	Quality	5		Tanzania, Benin, Gabon, Cote d'Ivoire Uganda
	High yield	16	Submit	Mauritania (Sahel series 2007-2009)
Lowland	Salt	11	PVS	Gambia, Mali, Senegal
	Cold	16	PVS	Mali, Senegal
	Fe toxicity	18	PVS	Burkina Faso, Ghana, Guinea, Nigeria
		4		Guinea Conakry (CK)
	High yield	5	NPT, submit	Mozambique, Tanzania, Kenya
		3	DUS	Uganda
High Elevation	Cold	10	PVS	Madagascar, Ethiopia

GRISP
Theme 2
All Products



Varieties Released in 2011-2012

<ul style="list-style-type: none"> ● Upland ● Lowland ● Irrigated 	<ul style="list-style-type: none"> ● Benin * ● Zimbabwe ● Nigeria ● Ethiopia 	NERICA 1, 2, 3, 4, 6, 7, 8 NERICA 1, 3, 7, NERICA 7 (FARO 58), NERICA 8 (FARO 59) WAB 189 (Cold), FOFIFA3737 (Cold), WAB 515-B-16A1.1 (Cold)
	<ul style="list-style-type: none"> ● Nigeria ● Benin * 	NERICA L19 (FARO60), NERICA L34 (FARO61) NERICA L20, NERICA L14
	<ul style="list-style-type: none"> ● Burundi ● Mozambique ● Mali 	IR77713-30-1-1-3, IR79511-47-2-6-5 Makassane, IR80482-64-3-3-3 Sahel 177 (aroma), Sahel 316, Sahel 306

Theme 3: Sustainable productivity enhancement

Determinants and product development <ul style="list-style-type: none"> ● Land prod. ● Water prod. ● Nutrient prod. ● Labor prod. 	Integration – field level <ul style="list-style-type: none"> ● GAPS from seed to harvest ● Intensification / diversification / yield and productivity gap closure 	Integration at village, watershed level <ul style="list-style-type: none"> ● Environmental services ● CC mitigation 	<ul style="list-style-type: none"> ● Public-private partnerships ● Re-packaging ● Policy 	Wide Scale Diffusion <ul style="list-style-type: none"> ● M&E, stewardship
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Yield and productivity gap surveys

**GRiSP
Products
3.1.4, 3.3.5**

- Target area: 1–3 rice sector development hubs in 15 countries
- Yield gap survey
 - >> Objective: identify determinants of rice productivity in the hubs
 - 1. Protocol available
 - 2. Training workshop on Feb.
 - 3. Data collection tool developed
 - 4. Video & field guide drafted
 - 5. Establishment of weather stations
 - 6. Backstopping visits (Oct. to Dec. 2012)

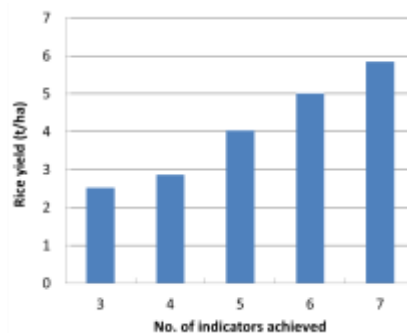


Rice productivity and yield determinants

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Products
3.1.4, 3.3.5**

Determinants of rice productivity in irrigated lowland in Benin >> use as GAP check-list

1. Residue management
2. Plowing method
3. Drought
4. Rat damage
5. N application rate
6. Land leveling
7. Sand content in the soil



Land preparation and weeding

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Products
3.3.3 and
4.1.1**



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Nutrient manager (NMR) on-farm testing in the 1st season in Senegal

**GRiSP
Product
3.1.2**


- With NMR, about 1.9 t/ha or 30% yield increase

1. 3 splits in NMR > 2 splits in farmers' practices (FFP)
2. Late 2nd split application in FFP (around booting stage)


- Yield data available from nutrient omission trials in Benin, Burkina Faso, Nigeria, Niger, Mali for testing of NMR

Practice	GY (Mg ha ⁻¹)
FFP	~6.4
NMR	~8.3

ΔGY = 1.9 Mg/ha, n=16, +30.2%



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GRiSP
Product 3.3.2

Weed management videos

- Two farmer-to-farmer videos on labor-saving weed management options:
 - 1) “rotary-hoe weeding in lowland rice”
 - 2) “safe and efficient use of herbicides”
- Languages: English, French, Portuguese, Swahili and Dagbani
- Produced by *Real2Reel Film Productions*:
 - 1) Filming in September 2012
 - 2) 3 locations: Ifakara, Morogoro and Moshi
- DVD production
 - 1) combined with previous AfricaRice “Weed Management” and “Transplanting” videos



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Theme 4: Extracting more value from rice harvests through improved quality, processing, market systems and new products

<p style="text-align: center;">Determinants and technology development</p> <ul style="list-style-type: none"> ● Post-harvest losses ● Grain quality ● New products 	<p style="text-align: center;">Integration at farm level</p> <ul style="list-style-type: none"> ● GAPs from seed to rice miller 	<p style="text-align: center;">VC upgrading</p> <ul style="list-style-type: none"> ● Aggregation ● Proof of concept – ‘rice sector development hubs’ 	<ul style="list-style-type: none"> ● Public-private partnerships ● Re-packaging ● Policy 	<p style="text-align: center;">Wide Scale Diffusion</p> <ul style="list-style-type: none"> ● M&E, stewardship
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Harvest and post-harvest processes

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Product
4.1.1



Marketing local rice (1)

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Product
4.3.4



Marketing local rice (2)

**GRiSP
Product
4.3.4**

Preference

Comparison	Red Segment (%)	Green Segment (%)
Happiness vs. Sunu Ceeb	40	60
Happiness vs. Ndanane	35	65
Noblesse vs. Sunu Ceeb	38	62
Noblesse vs. Ndanane	42	58
International vs. local	38	62

WTP

Comparison	Red Bar (FCFA/kg)	Green Bar (FCFA/kg)
Happiness vs. Sunu Ceeb	70	85
Happiness vs. Ndanane	70	50
Noblesse vs. Sunu Ceeb	45	80
Noblesse vs. Ndanane	60	65
International vs. local	60	70

- Consumers pay 17% price premiums for preferred brand
- Higher preference for local brands
- But essentially two market segments
- Better target both segments through “hybrid” brand? E.g.: Durabilis’ Terral

Rice databases to support rice policy, technology targeting and impact assessment.

GRiSP Product 5.3.2

- Annual update of regional rice statistics on rice area, yield and production

2012 Africa Rice Trends updated,

Estimation of rice area by ecology in Africa,

Individual countries Rice Facts sheets

Share of area per ecology in all countries

Ecology	Share (%)
Irrigated	22%
Upland	37%
Lowland	36%
Other	5%

■ Irrigated
 ■ Upland
 ■ Lowland
 ■ Other

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Theme 5: Regional integration of rice policies

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Product
5.3.4



Consultative workshop on the classification of rice in the tariff bands of ECOWAS common external tariff - Cotonou, Benin 3 - 4 / 3 / 2012



African Union / Africa Rice Joint Consultation Meeting
Africa Rice Center Cotonou, Benin 15 - 16 March, 2012



Theme 6: Technical experts services for rice sector investment and disaster or post-conflict response

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Product
6.1.4

- Support to the Nigerian Rice Transformation Agenda
- Support to rice research programs in Sierra Leone and Liberia as part of WAAPP
- Technical support for re-development of small scale irrigation scheme in Central Mozambique



Linking millers and rice growers

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Product
6.4.2

- Southern Mozambique: Linking local rice mill and rice growers, involving 3 farmers groups from 2 villages (50 farmers)
- Three Central Africa countries (Cameroon, Chad and CAR): establishment of 6 'rice quality centers'



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Weekly field schools with 400 Imbo plain farmers (Burundi)

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Product
6.4.2



Individual Training – by Region

Criteria	Category	Year			
		2011		2012	
		AfricaRice	IRRI	AfricaRice	IRRI
Region	West Africa	76	2	74	
	East Africa (including Madagascar, Ethiopia)	14	3	21	14
	Central Africa	2		2	
	Northern Africa (only Egypt)	1		1	
	Other	2			
Gender					
	Male	73	3	74	10
	Female	22	2	24	4
	Grand Total	95	5	98	14

Note: IRRI's numbers only account for African participants



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Group training

	Year			
	2011		2012	
	AfricaRice	IRRI	AfricaRice	IRRI
Total organized	23	7	24	6
Gender				
<i>Male</i>	271	39	356	33
<i>Female</i>	72	16	60	10
Grand Total	343	55	416	43

Note: IRRI's numbers only account for African participants



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Looking ahead

- Keep clear product focus
- Strengthen interactions at GRiSP theme level
- Strengthen Task Forces (mechanization?)
- Backstop Hub activities (learn from experiences elsewhere in SSA, Asia and LAC)
- Pro-actively link with development partners to stimulate out-scaling of products / services
- Obtain better insight in capacity building efforts by GRiSP in Africa; co-develop coherent training curricula and Rice Information Gateway
- ...
- ...
- (!) Many events: CARD SC + general meeting, TICADV, NEC+COM meetings, GRiSP global forum, 3rd Africa Rice Congress...



Thank you



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