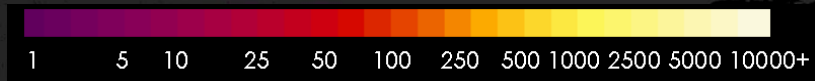


Valeur de la production de riz en US\$ / ha (Nelson, 2010)

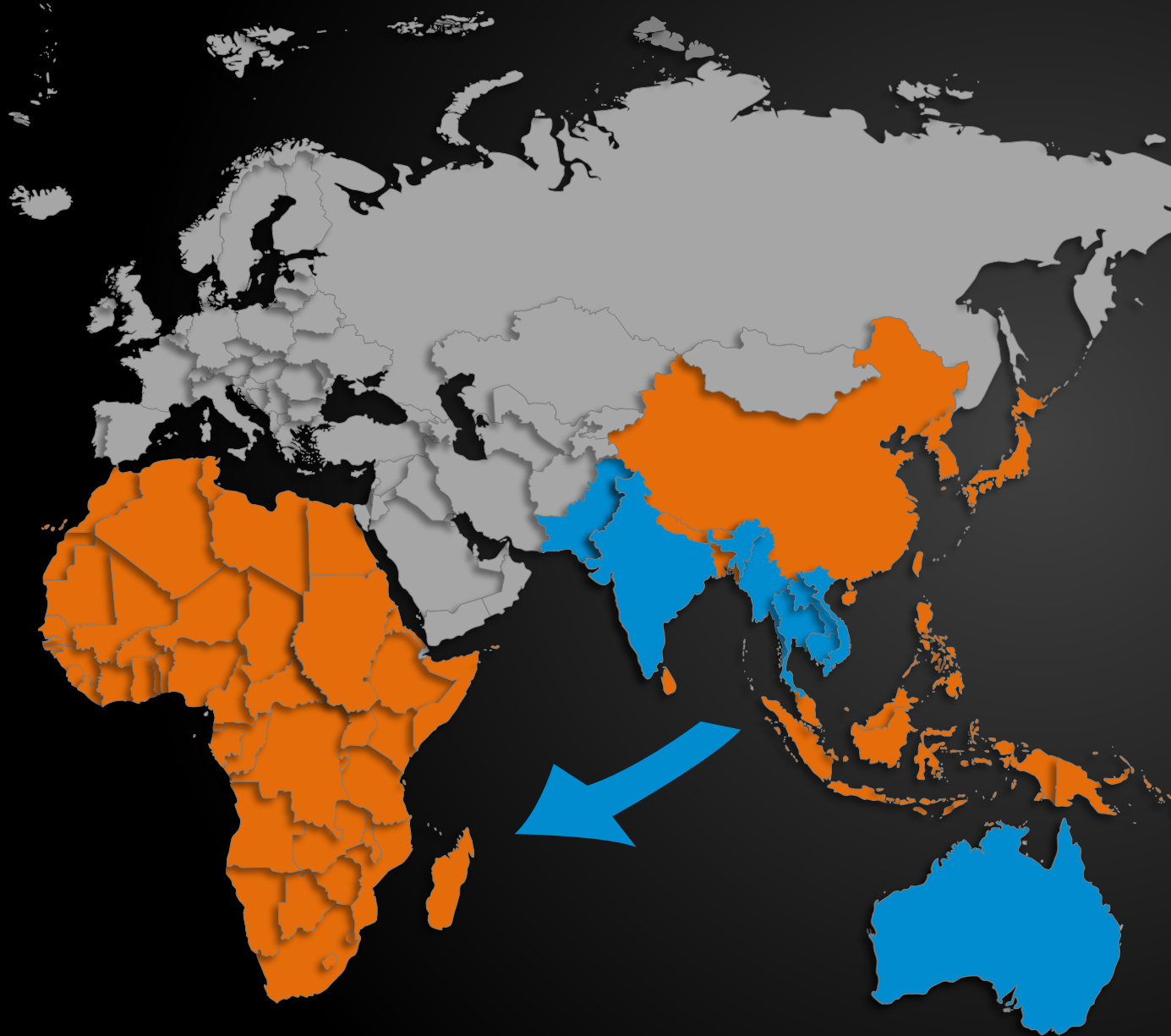


Moderniser les chaînes de valeur du riz pour améliorer la compétitivité du riz national par rapport au riz importé en Afrique

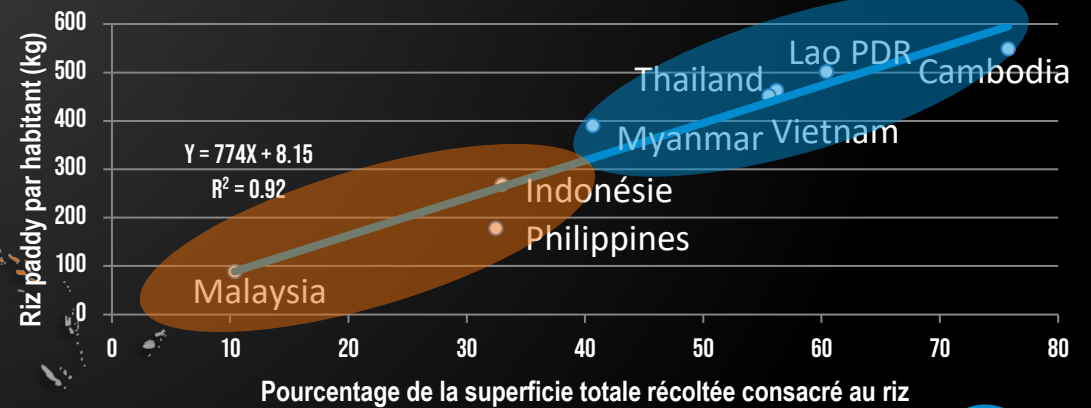
Matty Demont,

*Programme phare du CGIAR « Modernisation des chaînes de valeur du riz »
Institut International de Recherche sur le Riz (IRRI), Los Baños, Philippines*

Contexte mondial

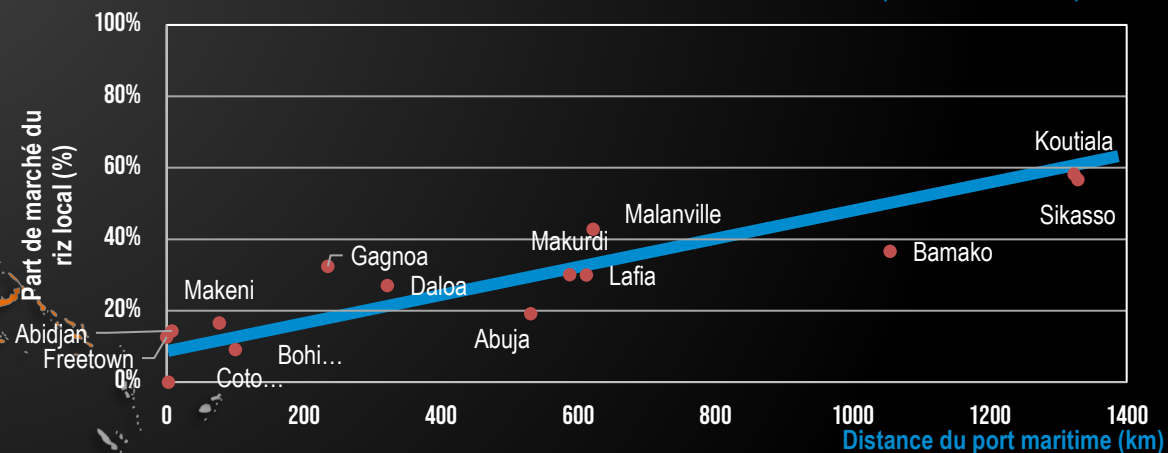
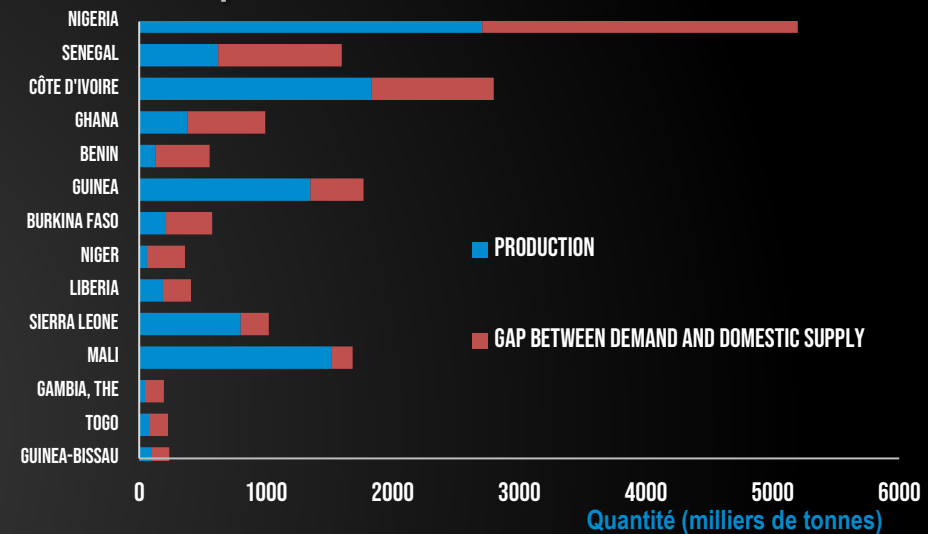


PHP/kg riz usiné	Philippines	Indonésie	Thaïlande	Vietnam
Coût de séchage	0,26	0,62	0,33	0,52
Frais de transport	2,09	2,22	1,08	1,76
Frais d'usage	1,38	1,22	0,89	0,93
Frais de stockage	0,19	0,40	0,20	0,23
Frais de conditionnement	0,45	0,24	0,14	0,22
Coût du fonds de roulement	0,27	0,28	0,09	0,11
Coût de commercialisation total	4,63	4,97	2,73	3,78
Rendement supérieur au coût principal	4,43	0,65	2,54	0,77
Marges	9,06	5,61	5,27	455



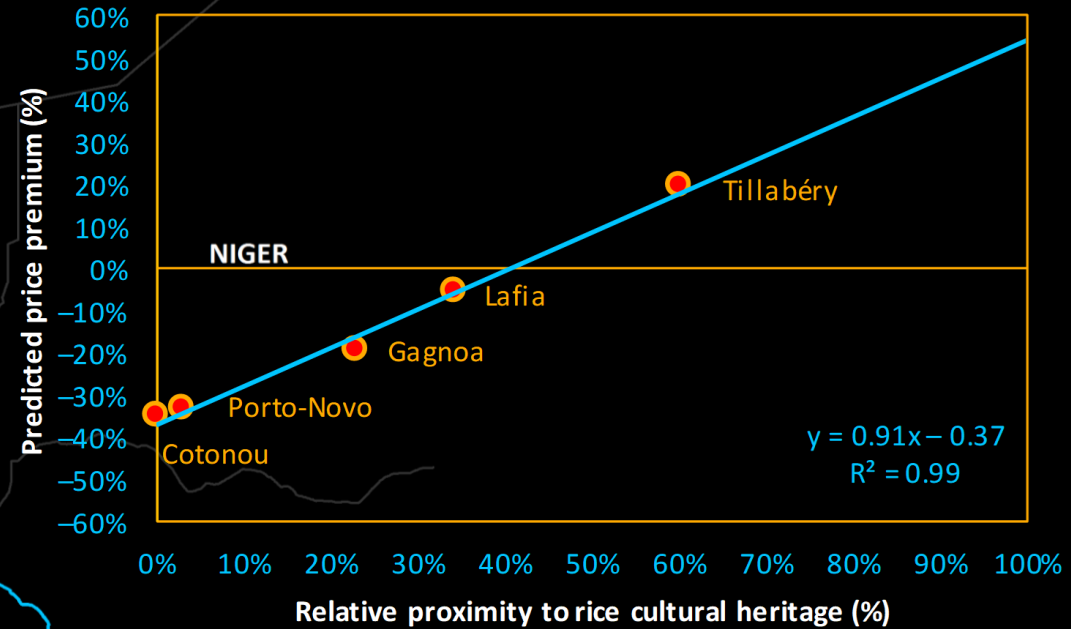
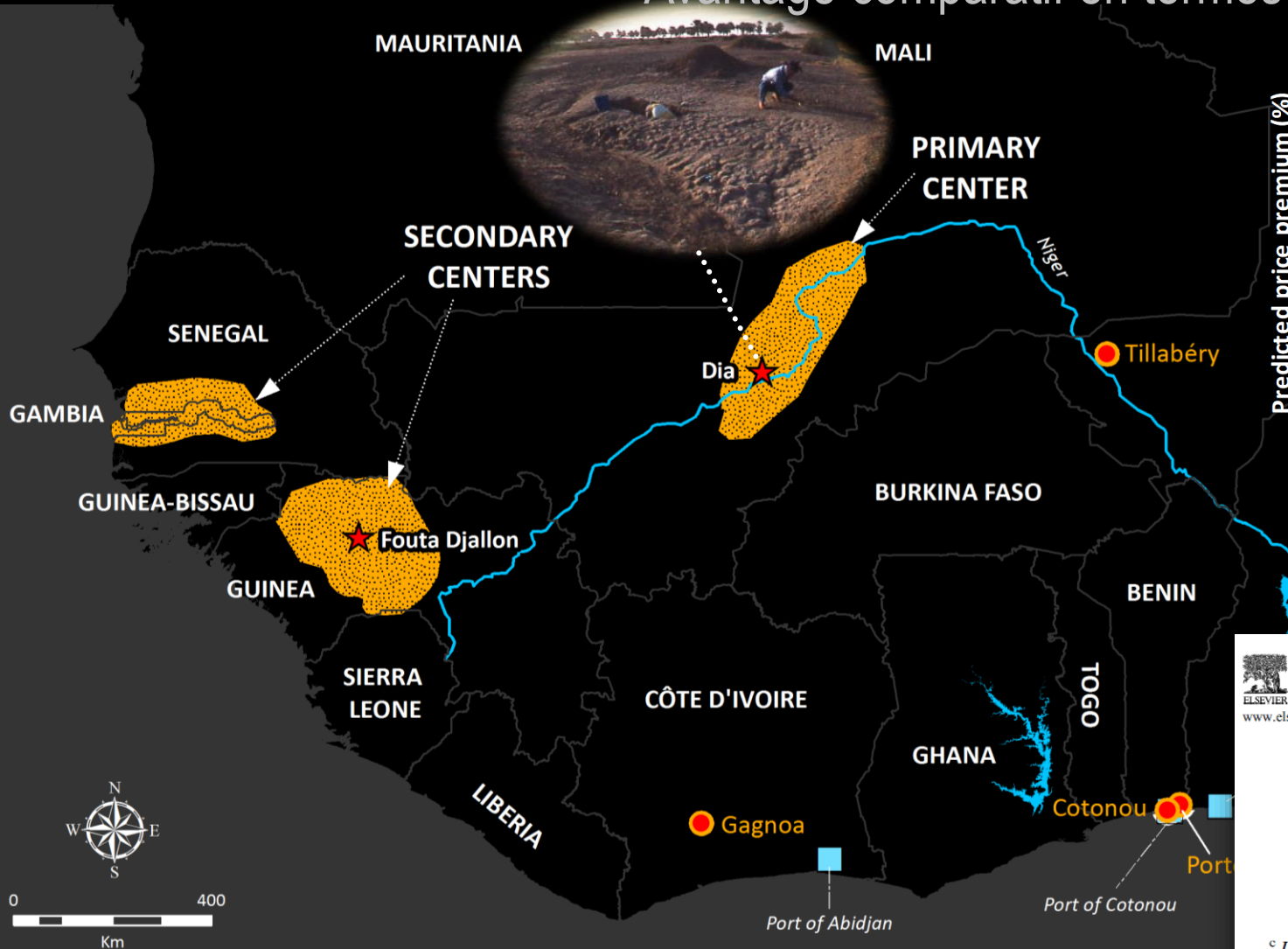
Afrique de l'Ouest

Compétitivité du riz national par rapport au riz importé



Afrique de l'Ouest

Avantage comparatif en termes de demande



World Development Vol. 96, pp. 578–590, 2017
0305-750X/© 2017 Elsevier Ltd. All rights reserved.

<http://dx.doi.org/10.1016/j.worlddev.2017.04.004>

Comparative Advantage in Demand and the Development of Rice Value Chains in West Africa

MATTY DEMONT^a, ROSE FIAMOHE^b and A. THIERRY KINKPÉ^{c,*}

^a International Rice Research Institute (IRRI), Metro Manila, Philippines
^b Africa Rice Center (AfricaRice), Cotonou, Benin
^c Laboratory of Analysis and Research on the Economic and Social Dynamics (LARESD), University of Parakou, Parakou, Benin

The boundaries are not authoritative and do not reflect any stance on the part of IRRI.

Segmentation



Pays du groupe 1

Pays côtiers où le riz importé est le produit de consommation préféré des consommateurs

Exemples : Mauritanie, nord du Sénégal (Dakar, vallée du fleuve Sénégal), Liberia, Côte d'Ivoire, Ghana, Togo, Bénin, Nigeria, Cameroun

Pays du groupe 2

Pays côtiers où le riz local est le produit de consommation préféré pour des raisons culturelles (adoption du riz le long du fleuve Niger en Afrique de l'Ouest et indianisation en Afrique de l'Est)

Exemples : Sénégal (Casamance), Gambie, Guinée, Sierra Leone, Tanzanie, Mozambique, Kenya, Madagascar

Pays du groupe 3

Pays sans littoral

Exemples : Mali, Niger, Burkina Faso, République centrafricaine, RD Congo, Éthiopie, Ouganda, Rwanda, Zambie

Stratégies nationale de développement rizicole

Policy Sequencing and the Development of Rice Value Chains in Senegal
 Matty Demont and Amy C. Rizzotto
 In response to the world food crisis in 2008, Senegal developed a producer national food self-sufficiency programme. However, a critical question is not whether the programme can meet its ambitious target of self-sufficiency in rice production by 2015, but, if at least, how will domestic rice reach urban markets, where consumers generally prefer imported rice for its superior grain quality. Information collected through interviews and a stakeholder workshop advances the argument that policy sequencing will be crucial in order to upgrade rice productivity and to be preceded by investments in post-harvest grain quality before sector-wide marketing strategies can be adopted that enhance competitiveness of domestic rice to imported rice.

Key words: Policy sequencing, food security, food quality, food investment, value chain, economic development, self-sufficiency, consumer, import substitution

1. Introduction
 Since independence in 1960, the demand for rice in Senegal has risen on average (Bassant et al., 2012). With a growing urban population and 1990s rice outlook, and a need to increase rice production, it is clear that rice is a key crop for Senegal. In 2011, rice consumption surpassed availability in Senegal. In 2011, rice consumption surpassed availability in Senegal.

2. Reversing urban bias in African rice markets: A review of 19 National Rice Development Strategies
 Matty Demont^{a,b,c}
^aWatershed Governance, University of Guelph, Guelph, Ontario, Canada
^bInternational Rice Research Institute (IRRI), Los Baños, Laguna, Philippines
^cWatershed Governance, University of Guelph, Guelph, Ontario, Canada

ABSTRACT
 Economic development in poor countries is often hampered by urban bias. Partly as a result of this bias, African rice production has been largely depressed. In the 1970s and 1980s, rice outlook shifted and arguments as to why government intervention in rice markets are advanced during the 2008 food crisis. African governments need to take account of the fact that the increasing importance of imported rice for urban consumers may be a result of the increasing importance of imported rice for urban consumers. This paper reviews 19 national rice development strategies of 19 African countries and compares them with the urban bias literature. It finds that, in general, more resources are allocated to the rice and wheat value chains than to other crops.

1. Introduction
 In May 2008, world rice prices spiked in just a few months as a result of a combination of factors (Drelich and Taylor, 2010). In the weeks following the price spike, several countries in the world, including Senegal, implemented policies to increase rice production. In Senegal, the price spike resulted in a 2.2% increase in rice production in 2008. In Senegal, the price spike resulted in a 2.2% increase in rice production in 2008.

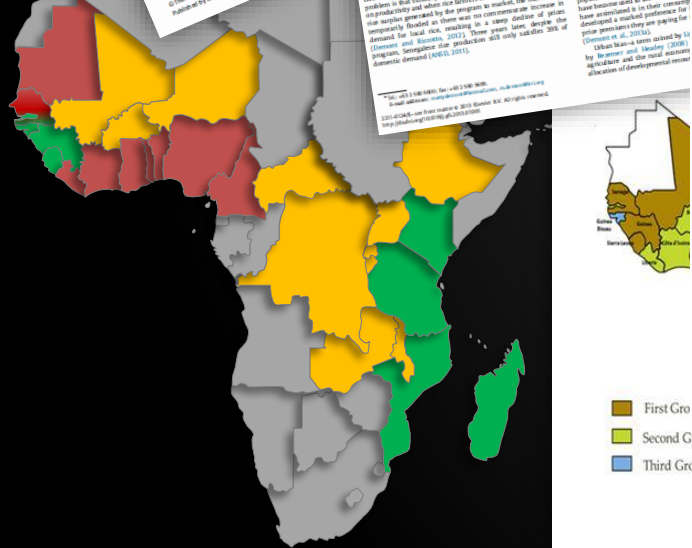
Table 1. Investment portfolios implemented by 19 African member countries of the CARD that have submitted national rice development strategies (NRDS)

Country	Total investment (10 ⁶ US\$ ^a)	Time horizon	Area expansion, irrigation & infrastructure	Supply-shifting investments			Demand-lifting investments			Other ^c
				R&D, extension, innovation, capacity building	Intensification, access to land, seed, credit, inputs, mechanization	Processing (milling, parboiling) & storage capacity	Value-adding investments	Promotion, advertising, communication, awareness creation		
				Quality upgrading, capacity building, governance	Branding, labeling, identity creation, certification	Value chain upgrading, MIS ^b , market infrastructure, linkages				
Group 1: Coastal countries characterized by dominant consumer preferences for imported rice										
Benin	x	2008-18	x	x	x	x	-	x	-	x
Cameroon	382	2008-18	33%	14%	36%	9%	-	1%	-	7%
Côte d'Ivoire	954	2012-16	16%	5%	63%	13%	x	2%	1%	x
Ghana	x	2008-18	x	x	x	x	x	x	-	x
Nigeria	x	2008-18	x	x	x	x	x	x	x	x
Senegal	348	2009-11	79%	1%	20%	-	-	-	-	x
Togo	x	2008-18	x	x	x	x	x	-	-	x
Group 2: Coastal countries characterized by dominant consumer preferences for local rice										
Guinea	1,300	2008-18	41%	1%	39%	x	x	x	-	20%
Kenya	x	2008-18	x	x	x	x	-	-	-	x
Madagascar	x	2008-18	x	x	x	-	-	x	-	x
Mozambique	357	2008-11	x	x	x	x	x	x	-	x
Sierra Leone	57	2009-18	73%	14%	x	x	-	10%	-	4%
Tanzania	x	2008-18	x	x	x	x	x	-	-	x
Group 3: Landlocked countries										
Burkina Faso	517	2008-18	54%	6%	20%	17%	-	-	-	3%
Ethiopia	x	2009-19	x	x	x	x	x	-	x	x
Mali	1,600	2008-18	49%	3%	48%	x	-	x	-	x
Rwanda	157	2011-18	39%	9%	15%	8%	1%	-	28%	1%
Uganda	x	2008-18	x	x	x	x	x	x	-	x
Zambia	x	2011-15	x	x	x	x	x	x	-	x

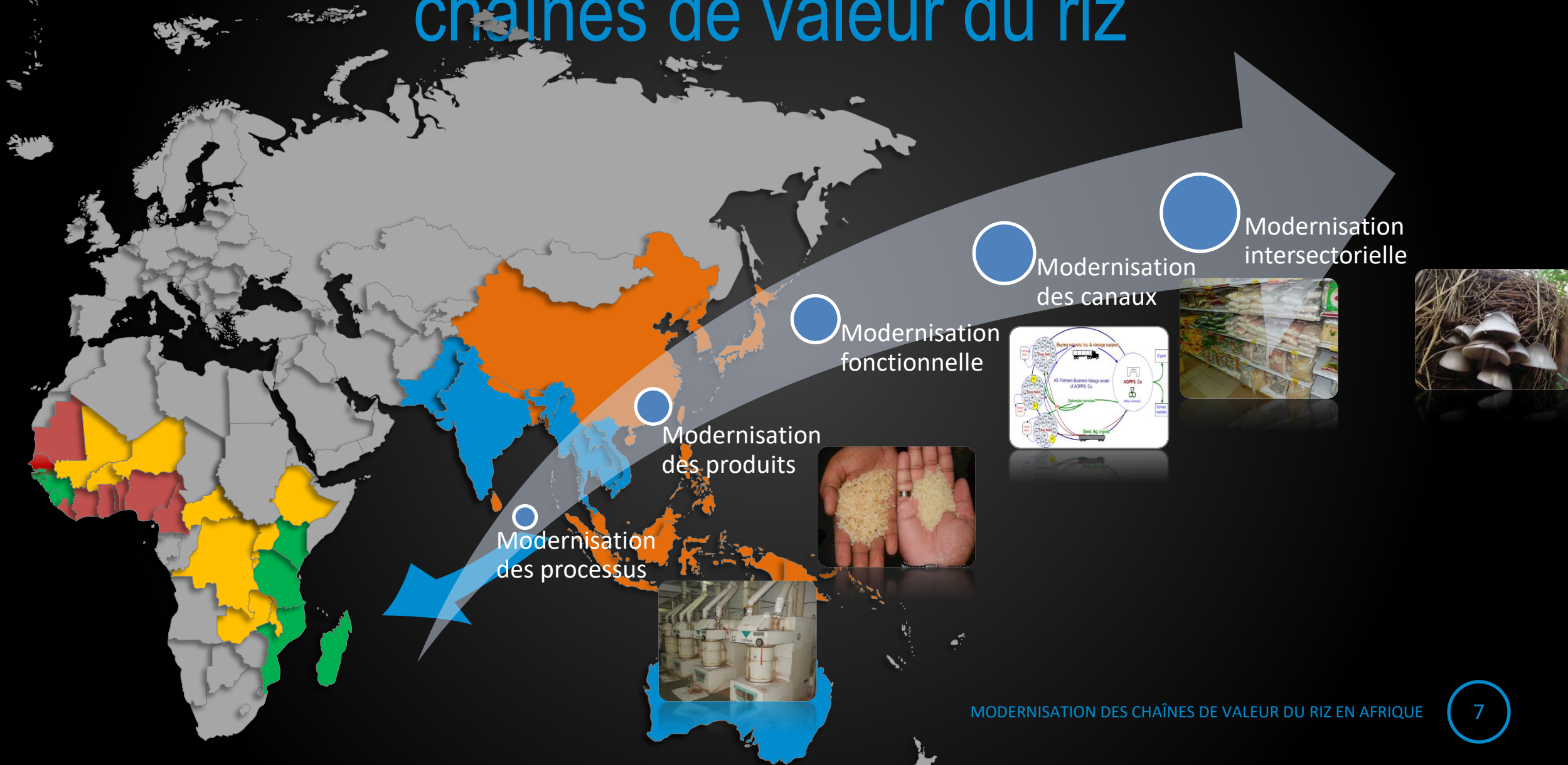
Notes: The symbol "x" indicates that the investment is planned, but no detailed budget has been provided in the NRDS document. A dash indicates that the investment is missing or not convincingly elaborated in the NRDS document. In some cases, the investment shares may not add up to 100% due to rounding.

Sources: NRDS documents published on the CARD (2012) web portal

- First Gro
- Second Group Countries
- Third Group Countries



Trajectoire de la modernisation des chaînes de valeur du riz



Expériences de marché

Policy Sequencing and the Development of Rice Value Chains in Senegal
 Matty Demont and Amy C. Rizzotto
 In response to the world food crisis in 2008, Senegal developed a producer national food self-sufficiency programme. However, the critical question is not whether the programme can meet its ambitious target of self-sufficiency in rice production by 2013, but, if at least, how will domestic rice reach urban markets, where consumers generally prefer imported rice for its superior grain quality. Information collected through interviews and a stakeholder workshop advances the argument that policy sequencing will be crucial in order to upgrade productivity and to be preceded by investments in post-harvest grain quality and chain competitiveness of domestic rice to imported rice.

1 Introduction
 Since independence in 1960, the demand for rice in Senegal has increased on average (Bassant et al., 2012). With a growing urban population and 1990s rice outlook, and arguments as the main staple, it is not surprising that rice has become a major crop in Senegal. Highest substitution rates in Africa, 2.3% a year during 2000-2005 (Dumont, 2011), the Senegalese appetite for rice is unlikely to diminish. In 2011, rice consumption surpassed 1.5 million metric tons, representing 92% of total cereal consumption (FAO, 2012). The Senegalese government has been investing in rice production since 2008, with the aim of achieving self-sufficiency in rice by 2013. The NEER aimed at achieving self-sufficiency in rice by 2013, mainly by expanding area and encouraging commercialisation of rice production in the Senegal River Valley (SRV) (Diagne et al., 2013). The NEER's strategy was to increase rice production by increasing the area under rice production and by increasing the productivity of the area. The NEER's strategy was to increase the area under rice production and by increasing the productivity of the area. The NEER's strategy was to increase the area under rice production and by increasing the productivity of the area.

Global Food Security
 Contents lists available at ScienceDirect
 Global Food Security
 journal homepage: www.elsevier.com/locate/gfs

Reversing urban bias in African rice markets: A review of 19 National Rice Development Strategies
 Matty Demont^{a,*}
^a African Rice Center (AfricaRice), 12000 Blvd. de la Vallée, Dakar, République de Sénégal

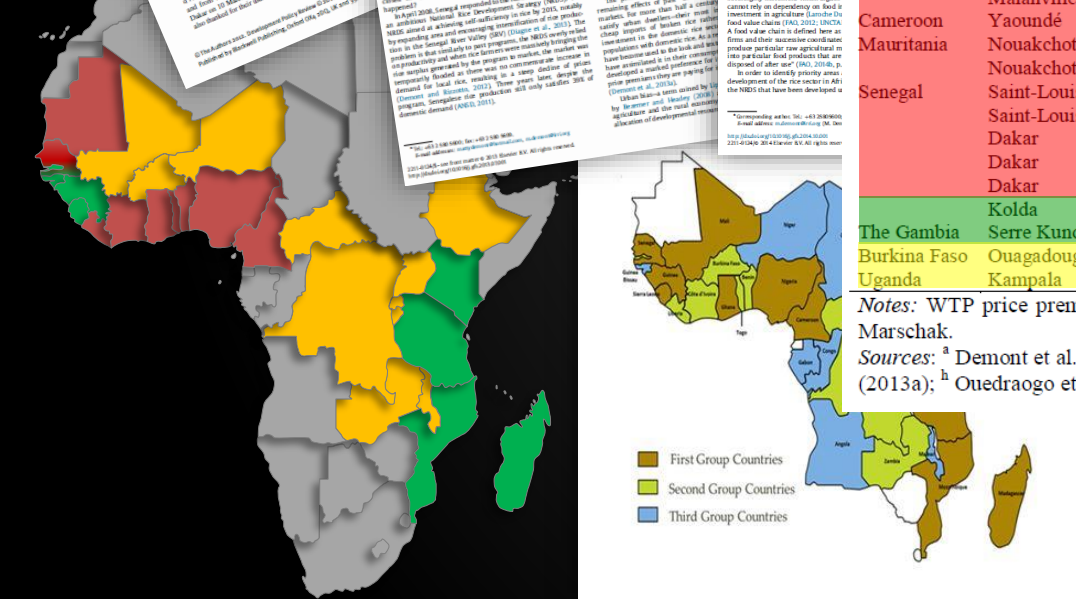
Upgrading rice value chains: Experimental evidence from 11 African markets
 Matty Demont^{a,*}, Maimouna Ndour^b
^a International Rice Research Institute (IRRI), Los Baños, Laguna, Philippines
^b African Rice Center (AfricaRice), Senegal, Senegal

ABSTRACT
 This classic 'technology transfer' effect...
1. Introduction
 In the wake of the 2008 food crisis, the African Rice Development (ARD) was launched in 2008 in 20 African countries...
 *Corresponding author. Tel.: +33 20300000. E-mail address: matty.demont@irri.org (M. Demont).
 Tel.: +233 202 202 202. E-mail address: maimouna.ndour@irri.org (M. Ndour).

Table 1
 Consumers' willingness to upgrade (WTU) standard rice to rice with superior intrinsic and extrinsic quality attributes and relative price premiums (WTP) they are willing to pay for these attributes in 11 African cities.

Country	City	Year	Methodology	Sample size	Origin	Type	Willingness to upgrade (WTU)				Willingness to pay (WTP)				Source
							Intrinsic		Extrinsic		Intrinsic		Extrinsic		
							Variety	Processing	Label	Info	Variety	Processing	Label	Info	
Benn	Glazoué	2009	Vickrey	100	Local	Parboiled	85–98%		0–2%		14–30%		a		
	Cotonou	2011	Vickrey	135	Local	Parboiled	95%		16%		4–8%		b		
	Malanville	2011	Vickrey	135	Local	Parboiled	87%		7–17%		18%		b		
Cameroon	Yaoundé	2012	Vickrey	120	Local	Mixed	75–89%		6%		17–39%		c		
Mauritania	Nouakchott	2009	Vickrey	50	Local	Mixed	32–54%		6%		34–38%		4%	c	
	Nouakchott	2009	Vickrey	50	Import	100%B	62–81%		–6%		25–26%		2%	c	
Senegal	Saint-Louis	2008	Vickrey	99	Local	Mixed	47–75%		–2%		43–47%		6%	d	
	Saint-Louis	2012	BDM	121	Local	F100%B	27–73%		5%		32–40%		4%	e	
	Dakar	2009	Vickrey	100	Local	Mixed	27–73%		5%		32–40%		4%	f	
Dakar	Dakar	2011	Vickrey	120	Import	100%B	58–63%		14%		36–44%		2%	c	
	Dakar	2012	BDM	120	Local	F100%B	27–73%		5%		32–40%		4%	f	
The Gambia	Kolda	2012	Vickrey	120	Import	100%B	86–88%		14%		22–35%		2%	c	
The Gambia	Serre Kunda	2010	Vickrey	100	Import	100%B	54–67%		14%		32–33%		2%	g	
Burkina Faso	Ouagadougou	2012	Vickrey	120	Import	5%B	52%		12–19%		25%		2–11%	h	
Uganda	Kampala	2011	Vickrey	120	Local	Mixed	67–83%				22–35%			c	

Notes: WTP price premiums are averaged over auction rounds and expressed relative to the price of standard rice. B = broken; F = fragrant; BDM = Becker-DeGroot-Marschak.
Sources: ^a Demont et al. (2012); ^b Zossou et al. (2013); ^c Unpublished dataset; ^d Demont et al. (2013c); ^e Costello et al. (2013); ^f Demont et al. (2013b; 2013c); ^g Demont et al. (2013a); ^h Ouedraogo et al. (2013).



Expériences de marché

+ opportunités – défis

Policy Sequencing and the Development of Rice Value Chains in Senegal
Matty Demont and Amy C. Rizzotto

In response to the world food crisis in 2008, Senegal developed a producer national food self-sufficiency programme. However, the critical question is not whether the programme can meet its ambitious target of self-sufficiency in rice production by 2015, but, if it does, how will domestic rice reach urban markets, where consumers generally prefer imported rice for its superior grain quality. Information collected through interviews and a stakeholder workshop advances the argument that policy interventions will be crucial in order to upgrade rice productivity and change progressively. Any large-scale investments in productivity before sector-wide marketing strategies can be adopted that to be preceded by investments in post-harvest grain quality, food chain competitiveness of domestic rice to imported rice, investment value chain, economic development, self-sufficiency, consumer, import substitution.

Reversing urban bias in African rice markets: A review of 19 National Rice Development Strategies
Matty Demont^{a,b}

Since independence in 1960, the demand for rice in Senegal has risen on average (Bassett et al., 2012). With a growing urban population and 1990s rice overstock sales and surpluses as the main staple, it took quickly and reactively to increase rice production during 2000-2010, with high substitution rates in Africa. However, the average rice yield in Senegal is 1.5 t/ha, which is far below the 2.5 t/ha target set by the National Rice Development Strategy (NRDS) in 2001. Rice consumption is projected to increase by 50% by 2050, which will require a 100% increase in rice production. National rice production is projected to increase by 50% by 2050, which will require a 100% increase in rice production. National rice production is projected to increase by 50% by 2050, which will require a 100% increase in rice production.

Comparative Advantage in Demand and the Development of Rice Value Chains in West Africa
MATTY DEMONT^a, ROSE YIANGHE^b and A. THIERRY KINKPE^c

Abstract: National rice development strategies in Africa are often supply-focused and implicitly assume that consumers will readily absorb increased rice supply. However, this is not always the case. This paper examines the demand-side constraints to rice production in West Africa and the role of the rice value chain in addressing these constraints. It argues that the rice value chain is a critical link between the rice producer and the consumer, and that it is essential for the rice value chain to be developed in order to meet the demand for rice in West Africa. The paper also discusses the role of the rice value chain in addressing the constraints to rice production in West Africa.

TABLE 6
FACTORS DETERMINING CONSUMERS' REVEALED PRICE PREMIUMS FOR UPGRADED DOMESTIC RICE RELATIVE TO IMPORTED RICE, AND STATED DEMAND FOR DOMESTIC RICE ON FIVE WEST AFRICAN URBAN MARKETS

Variable	Revealed price premium	Propensity of buying		Stated demand	
		Coefficient	Partial effect	Coefficient	Quantity demanded
Morning	-0.021 (0.019)	-0.078 (0.210)	-0.005	-1.969 (4.700)	-0.949
Taste premium local rice	0.281 (0.076)***	0.181 (0.926)	0.012	7.870 (18.449)	3.792
Taste premium imported rice	-0.351 (0.045)***	-1.037 (0.399)***	-0.067**	-18.822 (12.383)	-9.069
WOM premium local rice	0.470 (0.064)***	0.188 (0.700)	0.012	11.532 (15.243)	5.556
WOM premium imported rice	-0.489 (0.032)***	-0.286 (0.264)	-0.019	-3.478 (9.417)	-1.676
Distance to port (100 km)	0.042 (0.002)***	0.076 (0.033)**	0.005**	1.952 (0.703)***	0.941***
Distance to center of origin (100 km)	-0.014 (0.004)***	-0.126 (0.065)*	-0.008*	-13.495 (1.530)***	-6.502***
Mandé	0.159 (0.049)***	n.a. ^a	n.a. ^a	24.206 (9.513)***	11.663**
Female	-0.088 (0.021)***	-0.195 (0.242)	-0.013	-20.011 (5.563)***	-9.642***
Formal education	0.007 (0.024)	0.162 (0.247)	0.010	7.663 (6.015)	3.692
Age	0.000 (0.001)	-0.001 (0.011)	-0.000	0.155 (0.234)	0.075
Income per capita	0.000 (0.000)	0.000 (0.000)	0.000	0.001 (0.002)	0.000
Household size	0.000 (0.001)	-0.007 (0.012)	-0.000	-3.855 (0.572)***	-1.858***
Cleanliness	-0.040 (0.020)**	0.251 (0.244)	0.016	-10.086 (5.073)**	-4.860**
Whiteness	-0.018 (0.021)	0.336 (0.236)	0.022	-5.672 (4.972)	-2.733
Head rice recovery	-0.050 (0.027)*	-0.215 (0.264)	-0.014	-2.441 (8.472)	-1.176
Slenderness	-0.049 (0.021)**	-0.488 (0.229)**	-0.032**	0.612 (5.317)	0.295
Unstickiness	-0.013 (0.022)	-0.213 (0.245)	-0.014	1.019 (5.688)	0.491
Taste	-0.015 (0.022)	0.253 (0.232)	0.016	-1.358 (5.501)	-0.654
Aroma	-0.014 (0.020)	-0.084 (0.222)	-0.005	3.969 (5.259)	1.912
Softness	-0.080 (0.025)***	-0.112 (0.264)	-0.007	-3.327 (7.589)	-1.603
Swelling capacity	-0.075 (0.027)***	-0.536 (0.312)*	-0.035*	-8.143 (6.451)	-3.924
Other attributes ^b	-0.105 (0.031)***	-0.518 (0.293)*	-0.034*	-37.030 (10.425)***	-17.842***
Constant	-0.086 (0.069)	3.159 (0.980)***	-	184.069 (19.393)***	-
Number of observations	693	686	686	662	662
R ² and pseudo R ²	0.564	0.178	-	-	-
Sigma (error variance)	-	-	-	41.499 (2.162)***	-

Stratégie politique par segment

Séquence des politiques et priorités d'investissement

Pays du groupe 1

1. Amélioration du produit (indifférenciation), modernisation des processus et des canaux
2. Amélioration de la productivité
3. Amélioration de la demande (différenciation) : stratégie de marque et promotion

Pays du groupe 2

1. Amélioration de la productivité
2. Amélioration des produits (différenciation), modernisation des processus et des canaux
3. Marchés d'exportation

Pays du groupe 3

1. Amélioration de la productivité
2. Amélioration des produits, modernisation des processus et des canaux
3. Amélioration de l'infrastructure de commercialisation interne
4. Approche axée sur la chaîne de valeur régionale

Policy Sequencing and the Development of Rice Value Chains in Senegal
 Matty Demont and Amy C. Rizzotto
 In response to the world food crisis in 2008, Senegal developed a national food self-sufficiency programme. However, the critical question is not whether the programme can meet its ambitious target of self-sufficiency in rice production by 2015, but, if at least, how will domestic rice research and quality information collected through improved rice for its superior grain quality. Information collected through improved rice for its superior grain quality advances the programme by increasing and a stable rice market. Large-scale investments in productivity improvements will be crucial in order to upgrade the grain quality before large-scale investments in post-harvest grain quality improvements can be made. Any large-scale investments in post-harvest grain quality improvements will be crucial in order to upgrade the grain quality before large-scale investments in post-harvest grain quality improvements can be made. Any large-scale investments in post-harvest grain quality improvements will be crucial in order to upgrade the grain quality before large-scale investments in post-harvest grain quality improvements can be made.

Global Food Security
 Contents lists available at ScienceDirect
 journal homepage: www.elsevier.com/locate/gfs
Reversing urban bias in African rice markets: A review of 19 National Rice Development Strategies
 Matty Demont^{a,*}, Maimouna Ndour^b
^aInternational Rice Research Institute (IRRI), Los Baños, Laguna, Philippines
^bWest African Rice Development Centre (WARDC), Harare, Zimbabwe

Comparative Advantage in Demand and the Development of Rice Value Chains in West Africa
 MATTY DEMONT^a, ROSE IAMORHO^b and A. THIERRY KINKIN^c
^aInternational Rice Research Institute (IRRI), Los Baños, Laguna, Philippines
^bParsons, Paris, France
^cLaboratory of Analysis and Research on the Economic and Social Dynamics (LARES), University of Paris, Paris, France



■ First Group Countries
 ■ Second Group Countries
 ■ Third Group Countries

État de la modernisation des chaînes de valeur

2009–2019

Policy Sequencing and the Development of Rice Value Chains in Senegal
Matty Demont and Amy C. Rizzotto
In response to the world food crisis in 2008, Senegal developed a producer national food self-sufficiency programme. However, the critical question is not whether the programme can meet its ambitious target of self-sufficiency in rice production by 2015, but, if at least, how will it target rice for its superior grain quality. Information collected through domestic rice for its superior grain quality advances the programme that policy interventions will be crucial in order to upgrade its productivity and a stable and steady investment in post-harvest grain quality will be crucial to the success of the programme. Any large-scale investment in post-harvest grain quality will be crucial to the success of the programme. Any large-scale investment in post-harvest grain quality will be crucial to the success of the programme.

Global Food Security
Contents lists available at ScienceDirect
journal homepage: www.elsevier.com/locate/gfs

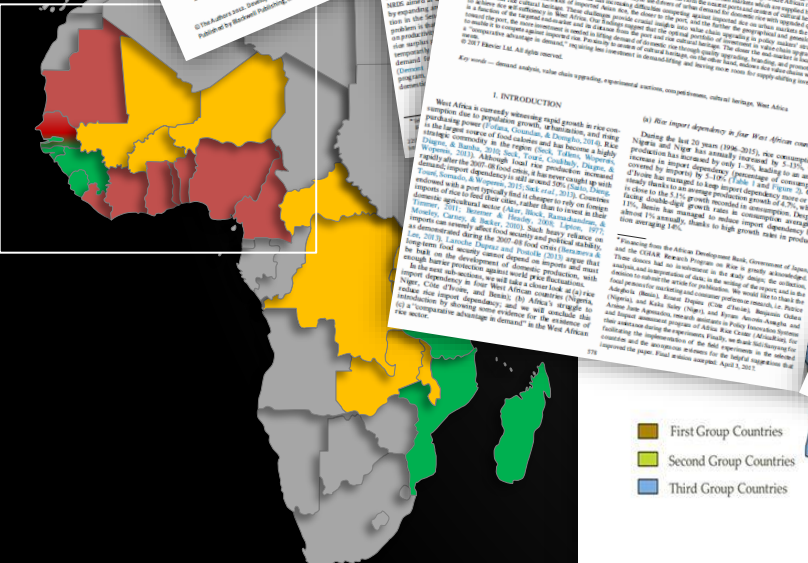
Global Food Security
Contents lists available at ScienceDirect
journal homepage: www.elsevier.com/locate/gfs

Reversing urban bias in African rice markets: A review of 19 National Rice Development Strategies
Matty Demont^{a,*}
* Université de Montpellier, CIRAD, CNRS, Montpellier, France

Upgrading rice value chains: Experimental evidence from 11 African markets
Matty Demont^{a,*}, Maimouna Ndour^b
* Université de Montpellier, CIRAD, CNRS, Montpellier, France

Comparative Advantage in Demand and the Development of Rice Value Chains in West Africa
MATTY DEMONT^a, ROSE FIAMOHÉ^b and A. THIERRY KINKINÉ^c
^aInternational Rice Research Institute (IRRI), Metro Manila, Philippines
^bLaboratory of Analysis and Research on Economic and Social Dynamics (LARES), University of Paris Lodron, Salzburg, Austria

How Can West African Rice Compete in Urban Markets? A Demand Perspective for Policymakers
Matty Demont, Rose Fiamohé and Eric Tollu
Contents lists available at ScienceDirect
journal homepage: www.elsevier.com/locate/gfs



Global Food Security 25 (2020) 100365
Contents lists available at ScienceDirect
Global Food Security
journal homepage: www.elsevier.com/locate/gfs

The state of rice value chain upgrading in West Africa
Guillaume Soullier^{a,b,*}, Matty Demont^c, Aminou Arouna^d, Frédéric Lançon^{a,b}, Patricio Mendez del Villar^{e,f}

^a CIRAD, UMR ART-DEV, F-34398, Montpellier, France
^b ART-DEV, Univ Montpellier, CIRAD, CNRS, Univ Montpellier 3, Univ Perpignan Via Domitia, Montpellier, France
^c International Rice Research Institute (IRRI), Los Baños, Laguna, Philippines
^d Africa Rice Center (AfricaRice), 01 BP 2551, Bouake 01, Côte d'Ivoire
^e CIRAD, UMR TETIS, F-34398, Montpellier, France
^f TETIS, Univ Montpellier, AgroParisTech, CIRAD, CNRS, IRSTEA, Montpellier, France

ARTICLE INFO
Keywords: Rice, Value chain, Upgrading, Africa, Contract farming, Milling
ABSTRACT
Following the food price crisis in 2008, African governments implemented policies aiming at crowding in investment in rice value chain upgrading to help domestic rice compete with imports. We assess the state of rice value chain upgrading in West Africa by reviewing evidence on rice millers' investment in semi-industrial and industrial milling technologies, contract farming and vertical integration during the post-crisis period 2009–2019. We find that upgrading is more dynamic in countries with high rice production and import bills and limited comparative advantage in demand. However, scaling of upgrading faces several challenges in terms of vertical coordination, technology, finance and policies. Our assessment can help value chain actors and policy makers refine upgrading strategies and policies to increase food security in West Africa.

1. Introduction
The food price crisis in 2008 redirected international attention towards domestic food value chains' (VCS) capacity and resilience in providing food security in developing countries (World Bank, 2008). In West Africa, the attention turned towards rice VCs because rice is the most important calorie source in this region (Macauley and Ramadita, 2015). To address chronic hunger through macro-nutrient self-sufficiency, African policy makers developed targeted National Rice Development Strategies (NRDS) under the Coalition for African Rice Development (CARD, 2019). However, while domestic rice production increased after the crisis, domestic rice VCs never managed to catch up with consumption, leading to an increasing gap that is satisfied through imports (Mendez del Villar and Lançon, 2015). Therefore, policy makers were urged to revisit their producer NRDS and create a favorable enabling environment for crowding in private sector investment in VC upgrading (Demont, 2013).
A decade after the 2008 food price crisis, it is time to make an assessment of the current state of rice VC upgrading in West Africa. Are domestic rice VCs being upgraded in this region, and if they are, what type of investments have been conducted and where? In particular, there is little information about investments in new processing technologies that would help domestic rice compete with imports quality- and cost-wise. Therefore, this paper attempts to document the technological and coordination changes that have been implemented at processing level in rice VCs in West Africa over the last decade. In particular, we compile and review evidence of public and private investment in upgraded processing facilities, contract farming schemes and vertical integration in 15 West African countries. We also assess the opportunities and challenges encountered in rice VC upgrading. Our assessment may help policy makers at national and regional levels and VC actors revisit and refine upgrading strategies and policies during the revision of the NRDS under the CARD Phase 2, which aims at doubling rice production in Sub-Saharan Africa from 28 million tons in 2019 to 56 million tons by 2030 (CARD, 2019).

2. Method
Initially, collect and validate evidence of investment in rice VC upgrading in the 15 West African countries (Table 2), we followed three stages. First, we conducted a non-systematic review of peer-reviewed and non-peer reviewed literature. We initiated our literature review with a focused search of economic studies through EconLit using the following keywords: rice; value chain; investment; mill; processing; contract; vertical integration; and the names of the 15 West African countries. The keywords aimed at identifying investments in semi-

* Corresponding author. CIRAD, UMR ART-DEV, F-34398, Montpellier, France.
E-mail address: guillaume.soullier@cirad.fr (G. Soullier).
<https://doi.org/10.1016/j.gfs.2020.100365>
Received 18 April 2019; Received in revised form 25 February 2020; Accepted 2 March 2020
2211-9124/© 2020 The Authors. Published by Elsevier B.V. This is an open access article under the CC BY license (<http://creativecommons.org/licenses/by/4.0/>).

État de la modernisation des chaînes de valeur dans 15 pays d'Afrique de l'Ouest, 2009–2019

Pays	Nombre d'investissements dans des usines industrielles et semi-industrielles qui étaient opérationnelles en 2019	Amélioration de la capacité de broyage globale (t/h)	Origine des investissements	Coordination verticale		Exposition aux importations		Approvisionnement annuel moyen en riz 2009–2018 (10 ³ tonnes)
				Agriculture contractuelle (producteurs)	Intégration verticale (ha)	Barrières naturelles à l'importation	Facture d'importation 2008 (10 ⁶ US\$)	
Nigeria 1	24 usines industrielles	177	IDE, DPI	>3000	>20 400	Aucune	772	3,512
Sénégal	15 usines industrielles et semi-industrielles	60	IDE, DPI	3500	3590	Aucune	645	438
Ghana 2	1 usine industrielle 3 usines industrielles	26	IDE, DPI	4000	750	Aucune	216	333
Mali	4 usines industrielles	25	IDE, DPI	n.a.	2200	Physiques et culturelles	36	1260
Côte d'Ivoire	2 usines industrielles 1 usine industrielle	15	PI, DPI	10 (expérimental)	–	Culturelles	472	1024
Burkina Faso	1 usine industrielle	7	DPI	140	–	Physiques	56	194
Liberia	2 usines industrielles	4	DPI, PI	–	–	Aucune	75	174
Niger	2 usines industrielles	4	PI	–	–	Physiques	126	194
Sierra Leone	1 usine industrielle	2	DPI	–	1300	Culturelles	85	668
Bénin	17 ESOP	–	DPI	140	–	Aucune	185	132
Togo	15 ESOP	–	DPI	>100	–	Aucune	9,3	86
Guinée 3	–	–	–	–	–	Culturelles	153	1248
Mauritanie	–	–	–	–	–	Aucune	77	119
Gambie	–	–	–	–	–	Culturelles	28	36
Guinée-Bissau	–	–	–	–	–	Culturelles	10	107

INDICATEURS DE RÉSULTAT DÉTERMINANTS

Déterminants de l'investissement

Table 4
Determinants of aggregate upgraded milling capacity in 15 countries in West Africa (stepwise linear regression).

Variable	Coefficient	SE	P-value
2008 import bill (10 ⁶ USD)	0.061	0.026	0.042**
Average annual milled rice production (2009–2019, 10 ³ tons)	0.032	0.006	0.000***
Cultural import barriers (dummy)	-24.168	8.992	0.021**
Constant	-2.773	6.792	0.691

Notes: Sample size = 15; $R^2 = 0.910$; Adjusted $R^2 = 0.886$; SE: standard error. Cultural and physical import barriers are captured through dummies. Variance inflation factors (VIF) are in the range of 1.20–2.29 with a mean VIF of 1.90. A Breusch-Pagan/Cook-Weisberg test for heteroscedasticity generates a P-value of 0.774. Significance levels: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

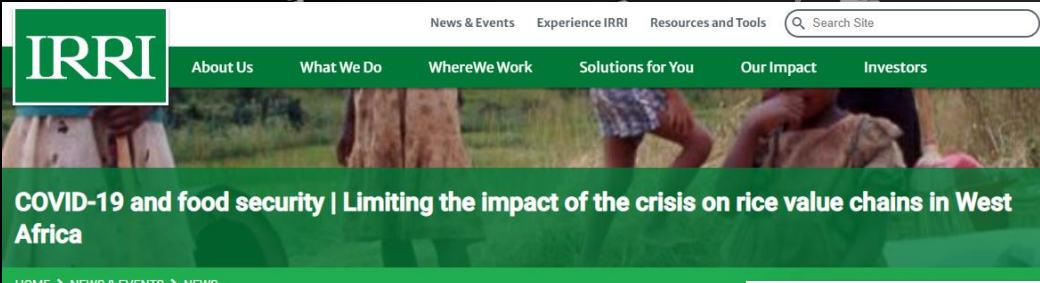
Source: Data compiled in Table 2.

- Nous avons mis en évidence l'hétérogénéité des investissements dans la modernisation des chaînes de valeur du riz dans 15 pays d'Afrique de l'Ouest grâce à l'indicateur suivant : **capacité totale d'usage** des usines industrielles et semi-industrielles modernisées (t/h) (total en Afrique de l'Ouest = 315 t/h)
- L'hétérogénéité de la modernisation s'explique à **89 %** par deux déterminants et un élément catalyseur :
 - **Déterminant 1 = Offre** : Offre annuelle moyenne de paddy (2009-2018) : un million de tonnes supplémentaires de riz blanchi disponible augmente la capacité d'usage améliorée de 32 t/h ; **COMPÉTITIVITÉ-PRIX/COÛTS**
 - **Déterminant 2 = Demande** : Facture d'importation 2008 : une facture d'importation plus élevée de 100 millions de dollars augmente de 6 t/h la capacité d'usage améliorée ; **COMPÉTITIVITÉ-QUALITÉ**
 - **Élément catalyseur = avantage comparatif limité dans la demande** : La proximité géographique ou généalogique avec le patrimoine culturel lié au riz préserve les préférences indigènes pour le riz local et réduit la capacité d'usage améliorée de 23 t/h ; **COMPÉTITIVITÉ CULTURELLE**
 - **Enclavement** : Pas d'effet significatif

COVID-19 : Soutenir le « Milieu caché »

- Options stratégiques élaborées pour la modernisation de la chaîne de valeur du riz et l'augmentation de la résilience des chaînes de valeur du riz à la pandémie de COVID-19 en Afrique de l'Ouest
- Message clé : soutenir le « Milieu caché » entre la production et la consommation dans les chaînes de valeur du riz
- Apporter un soutien financier aux rizeries en tant qu'intermédiaires essentiels pour assurer la sécurité alimentaire en Afrique de l'Ouest

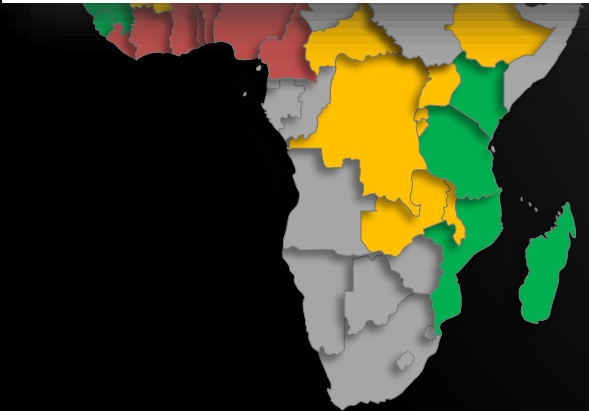
L'Organisation mondiale du commerce a publié notre note de synthèse dans *Trade for Development News*



HOME > NEWS & EVENTS > NEWS

JOINT PRESS RELEASE
30 July 2020

Rice plays a strategic role in food security in West Africa, but the region increasingly relies on imports, and local value chains face constraints in terms of technology, finance and coordination. In an article published in *Global Food Security*, scientists from CIRAD, AfricaRice, and the International Rice Research Institute (IRRI) propose different policy options to reduce the impacts of the COVID-19 pandemic on rice value chains in West Africa. To increase the resilience of local value chains, policymakers need to focus on supporting millers, especially by facilitating their access to credit.



Global Food Security 26 (2020) 100405

Contents lists available at ScienceDirect

Global Food Security

journal homepage: www.elsevier.com/locate/gfs

Policy options for mitigating impacts of COVID-19 on domestic rice value chains and food security in West Africa

Aminou Arouna^a, Guillaume Soullier^{b,c}, Patricio Mendez del Villar^{d,e}, Matty Demont^{f,g}

^a Africa Rice Center (AfricaRice), 01 BP 2553, Beninke 01, Cote d'Ivoire
^b CIRAD, UMR ART-DEV, F-34296, Montpellier, France
^c ART-DEV, Univ Montpellier, CIRAD, CNRS, Univ Montpellier 3, Univ Perpignan Via Domitia, Montpellier, France
^d CIRAD, UMR TETIS, F-34296, Montpellier, France
^e TETIS, Univ Montpellier, AgroParisTech, CIRAD, CNRS, INRAE, Montpellier, France
^f International Rice Research Institute (IRRI), Los Baños, Laguna, Philippines

ARTICLE INFO

Keywords:
 Food security
 Food policy
 Foodborne zoonotic pathogens
 Trade disruption
 Import
 West Africa

ABSTRACT

Rice plays a strategic role in food security in West Africa. However, the region increasingly relies on rice imports due to a growing and structural deficit, and domestic value chains face constraints in technology, finance and coordination. As a result, West Africa is very vulnerable to international and local trade disruptions, such as the ones currently inflicted by the COVID-19 pandemic. We build on evidence of the current state of domestic rice value chains upgrading in West Africa to anticipate the impacts of the COVID-19 pandemic on rice value chains resilience and their capacity to sustain food security in the region. Several policy options are proposed to help West African governments mitigate the impacts of the COVID-19 crisis on food security.

1. Context

Food insecurity remains prevalent in West Africa. During 2009–2018, the number of undernourished people in the region almost doubled from 32 to 56 million or 15% of the West African population, while globally, it decreased from 842 to 822 million (FAO et al., 2019). Rice increasingly plays a strategic role in food security in West Africa, where annual per capita consumption levels rose five-fold in the last six decades and are currently the highest on the continent. Production increased during the same period (USDA, 2019), but as a result of rapid demographic growth (2.7% annually) and diet changes, the region increasingly relies on rice imports (Mendez del Villar and Lourenco, 2015). This renders West Africa very vulnerable to international trade disruptions such as the ones currently inflicted by the corona virus disease (COVID-19) crisis. A prolonged pandemic can cause price increases due to disruptions in distribution chains and trade flows. World rice prices have been continuously increasing over the 12-month period March 2019–March 2020, featuring a step upward sloping trend since the outbreak of the COVID-19 pandemic in December 2019 (Fig. 1). In May 2020, this upward slope was interrupted for the first time, but it is uncertain at this point how rice prices will evolve from here onwards as a second wave of the pandemic is not excluded.

The increase in rice imports in West Africa is partly due to the low quality of locally produced rice which is largely supplied by fragmented, traditional value chains with little coordination between farmers, millers and traders. Sourcing paddy is mostly done through spot market transactions with little quality differentiation. As a result, domestic rice is often an inferior substitute for imports and domestic and global rice markets are poorly integrated (Demont, 2013). Apart from higher quality standards and lower variability and heterogeneity in rice quality, import value chains have other competitive advantages such as their superior dynamism and capitalization, thanks to better access to finance (Mendez del Villar and Lourenco, 2015). Consequently, when rice prices spike on the world market, domestic rice value chains fail to rapidly respond and compete against import value chains.

Farmed field experiments have revealed that local rice struggles to compete with imports even if its quality is upgraded to import standards (Demont et al., 2017). To meet these quality standards and satisfy urban consumers, rice value chains require substantial investment in modernization through process, product, functional (e.g., vertical coordination such as contract farming or vertical integration) and channel upgrading (e.g., expanding domestic value chains into import-biased urban markets) (Demont, 2013). Integration of domestic rice in import channels (wholesale and retail) is however challenging (Mendez del

^g Corresponding author.
 E-mail address: m.demont@irri.org (M. Demont).

<https://doi.org/10.1016/j.gfs.2020.100405>
 Received 15 May 2020; Received in revised form 30 June 2020; Accepted 2 July 2020
 Available online 8 July 2020
 2211-9124/© 2020 The Authors. Published by Elsevier B.V. This is an open access article under the CC BY license (<http://creativecommons.org/licenses/by/4.0/>).

Trade for Development News BY EIF

Telling the trade stories of least developed countries
 Brought to you by the Enhanced Integrated Review

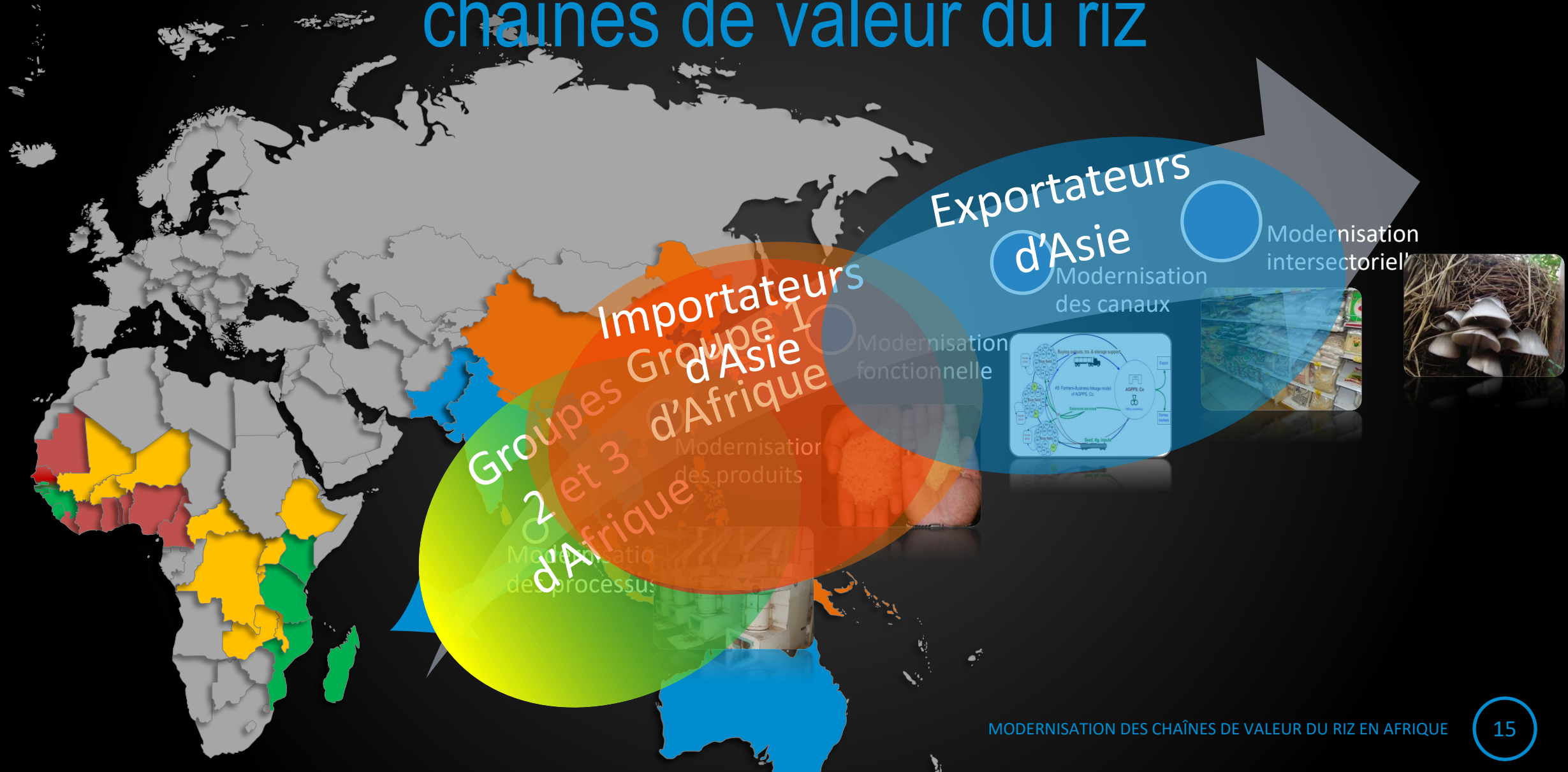
ABOUT COUNTRY TOPICS CATEGORIES SUBSCRIBE Available in:

December 03, 2020 Share: [Twitter](#) [Facebook](#) [LinkedIn](#)

Mitigating the impacts of COVID-19 on domestic rice value chains and food security in West Africa

by Aminou Arouna, Guillaume Soullier, Patricio Mendez del Villar and Matty Demont / in Op-ed

Trajectoire de la modernisation des chaînes de valeur du riz

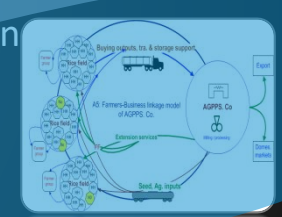


Groupes 2 et 3 d'Afrique
Modernisation des processus

Importateurs d'Asie
Modernisation des produits

Exportateurs d'Asie
Modernisation des canaux

Modernisation intersectorielle



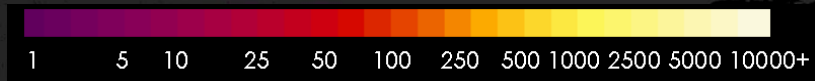
8 enseignements stratégiques à tirer pour NRDS 2.0

1. Le riz ouest-africain a de plus en plus de difficultés à **concurrencer** le riz importé
 - Plus les consommateurs citadins apprécient davantage les caractéristiques du riz asiatique **importé**
 - Plus le ménage qu'il doit nourrir est **grand**
 - Plus la décision d'achat est prise par la **femme**
 - Plus le **port** est proche
 - Plus la distance géographique et généalogique par rapport au **patrimoine culturel** du riz est grande
2. Les pays côtiers à **vocation importatrice** qui ont un port maritime proche d'une grande zone de consommation (capitale) et éloigné du patrimoine culturel du riz doivent consacrer davantage de ressources à la modernisation de la chaîne de valeur du riz :
 - Accroître la **compétitivité en termes de qualité** du riz national par rapport au riz importé
 - Mieux intégrer les marchés nationaux du riz dans les **marchés mondiaux** où la demande est plus élastique, accroître la participation des petits exploitants et améliorer les moyens de subsistance
3. Il est largement prouvé que les **investissements** dans la modernisation de la chaîne de valeur du riz se font dans les pays côtiers à vocation importatrice disposant d'un port maritime proche d'une grande zone de consommation et éloigné du patrimoine culturel du riz, par exemple, la modernisation est plus dynamique au **Nigeria** et au **Sénégal**
4. Il existe moins de données démontrant que les pays côtiers ayant un **avantage comparatif en matière de demande** et les pays enclavés investissent dans la modernisation de la filière riz
5. Dans ces pays, à moyen et à long terme, des investissements seront nécessaires pour **conserver** l'avantage comparatif au niveau de la demande
6. Les décideurs politiques doivent trouver un dosage optimal entre la promotion de la productivité, de la demande et de la modernisation de la chaîne de valeur pour faciliter les **flux d'investissements privés** (par exemple, les IDE)
7. À l'heure de la COVID-19, les décideurs politiques doivent soutenir le "milieu caché", c'est-à-dire les riziculteurs en tant qu'intermédiaires essentiels pour assurer la sécurité alimentaire en Afrique de l'Ouest
8. À long terme, les décideurs politiques doivent faciliter les flux d'investissements qui renforcent la résilience des chaînes de valeur du riz face aux futures pandémies/changements climatiques

Sources documentaires

1. Arouna *et al.* 2021. Moving toward rice self-sufficiency in sub-Saharan Africa by 2030: Lessons learned from 10 years of the Coalition for African Rice Development, *World Development Perspectives*, 21:100291.
2. Arouna *et al.* 2020. Policy options for mitigating impacts of COVID-19 on domestic rice value chains and food security in West Africa. *Global Food Security*, 26:100405.
3. Britwum *et al.* 2020. Confronting genetic gains with markets: Retrospective lessons from New Rice for Africa (NERICA) in Uganda. *Outlook on Agriculture*, 49(4):298–310.
4. Soullier *et al.* 2020. The state of rice value chain upgrading in West Africa. *Global Food Security*, 25:100365.
5. Soullier *et al.* 2019. The modernization of the rice value chain in Senegal: A move toward the Asian Quiet Revolution? *Development Policy Review*, 12459.
6. Soullier *et al.* 2018. Impacts of contract farming in domestic grain chains on farmer income and food insecurity. Contrasted evidence from Senegal. *Food Policy*, 79:179–198.
7. Fiamohe *et al.* 2018. How can West African rice compete in urban markets? A demand perspective for policy makers. *EuroChoices*, 17(2):51–57.
8. Diagne *et al.* 2017. What is the value of rice fragrance? Consumer evidence from Senegal. *African Journal of Agricultural and Resource Economics*, 12(2):99–110.
9. Demont *et al.* 2017. Comparative advantage in demand and the development of rice value chains in West Africa. *World Development*, 96:578–590.
10. Akoa Etoa *et al.* 2016. Consumer valuation of an improved rice parboiling technology: Experimental evidence from Cameroon. *African Journal of Agricultural and Resource Economics*, 11(1):8–21.
11. Demont *et al.* 2015. Upgrading rice value chains: Experimental evidence from 11 African markets. *Global Food Security*, 5:70–76.
12. Fiamohe *et al.* 2015. Assessing the effect of consumer purchasing criteria for types of rice in Togo: a choice modeling approach. *Agribusiness*, 31(3):433–452.
13. Mendez del Villar *et al.* 2015. West African rice development: beyond protectionism versus liberalization? *Global Food Security*, 5:56–61.
14. Naseem *et al.* 2013. Economic analysis of consumer choices based on rice attributes in the food markets of West Africa—the case of Benin. *Food Security*, 5:575–589.
15. Demont *et al.* 2013. Can local African rice be competitive? An analysis of quality-based competitiveness through experimental auctions. In French [Le riz africain peut-il être compétitif? Une analyse de la compétitivité-qualité par la méthode des enchères expérimentales] *Cahiers Agricultures*, 22(5):345–352.
16. Demont. 2013. Reversing urban bias in African rice markets: A review of 19 National Rice Development Strategies. *Global Food Security*, 2(3):172–181.
17. Demont *et al.* 2013. Reversing urban bias in African rice markets: Evidence from Senegal. *World Development*, 45:63–74.
18. Demont *et al.* 2013. Experimental auctions, collective induction and choice shift: Willingness-to-pay for rice quality in Senegal. *European Review of Agricultural Economics*, 40(2):261–286.
19. Demont *et al.* 2012. Policy sequencing and the development of rice value chains in Senegal. *Development Policy Review*, 30(4):451–472.
20. Demont *et al.* 2012. Consumer valuation of improved rice parboiling technologies in Benin. *Food Quality and Preference*, 23(1):63–70.

Valeur de la production de riz en US\$ / ha (Nelson, 2010)



Merci !

m.demont@irri.org

Bas Bouman, Guillaume Soullier, Aminou Arouna, Frédéric Lançon, Patricio Mendez del Villar
Programme de recherche du CGIAR sur le *riz (RICE)* et l'*Alliance AGGRi* de la Fondation Bill & Melinda Gates