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# GLOBAL FOOD SECURITY RESPONSE: WEST AFRICA RICE VALUE CHAIN ANALYSIS

**microREPORT #161**



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# ABBREVIATIONS

AGRA	Alliance for a Green Revolution in Africa
BEE	Business enabling environment
CAADP	Comprehensive Africa Agriculture Development Programme
CARD	Coalition for African Rice Development
CET	Common external tariff
CRS	Catholic Relief Services
DFID	Department for International Development (UK)
ECOWAS	Economic Community of West African States
FAO	Food and Agriculture Organization of the United Nations
F.A.S.	Free alongside ship
FCFA	African Financial Community Franc ( <i>Franc Communauté Financière d'Afrique</i> )
FEWS NET	Famine Early Warning System Network
F.O.B.	Free on board
GFSR	Global Food Security Response
GIS	Global information system
ICT	Information and communications technology
ITC	International Trade Center
IFPRI	International Food Policy Research Institute
IRRI	International Rice Research Institute
JICA	Japan International Cooperation Agency
MCC	Millenium Challenge Corporation
MT	Metric tons
NEPAD	New Partnership for Africa's Development
SAP	Structural adjustment program
SME	Small and medium enterprises
SRI	System of Rice Intensification
USAID	United States Agency for International Development
WAEMU	West African Economic and Monetary Union
WARDA	West Africa Rice Development Association
WFP	World Food Programme

# EXECUTIVE SUMMARY

In most of West Africa, rice production has not been able to meet the increases in demand triggered by population growth, rapid urbanization, increasing incomes and urban consumers' preferences in terms of cost and ease of cooking. As a result, the region relies on imports to supply half of its demand for rice. In the spring of 2008, world prices for rice tripled in less than four months and reached a 30-year, inflation-adjusted high. While in the past West African countries were able to afford price interventions to protect domestic rice consumers, this was not the case in 2008. With regional rice imports totaling more than 6 million metric tons (MT) per year, it is no longer financially possible for African countries to isolate themselves from the world market.

While the food crisis of 2008 may have been triggered by the rising price of oil and bio-fuels and a weak US dollar, there were also longer-term trends that have affected rice as well as other foods. Most significantly, world population is currently 6.7 billion and is expected to reach 9 billion by 2050. To keep pace, world food production will have to increase dramatically.

To date, increases in African food production, including rice, have been achieved largely through extending the area under cultivation. While experts at the African Rice Center argue that pockets of production show substantial increases in yields, average yields for the region do not appear to have changed over the last decade. This is not due primarily to a lack of productivity-enhancing technologies. Rather, African countries have not invested in developing the essential components of a competitive industry: research and extension, rural infrastructure and a stable marketing environment. Asian governments learned long ago how to provide these essentials, but not a single West African country has sustained such investments, together with supporting policies, for more than a few years at a time, leaving the region vulnerable to fluctuations in world markets.

The reaction of donors and African governments to the rice crisis has been to launch programs and policies to promote local production. The impacts of these programs are still being realized, though forecasts of the results of some of these actions are mixed. While investment in the rice sector is clearly needed, Peter Timmer, a renowned food policy expert, argues that many of the government rice initiatives focus almost exclusively on production to the exclusion of complementary initiatives in processing and marketing, which are so important to determining domestic rice prices. Other rice specialists note that these initiatives have further concentrated primarily on irrigation infrastructure and on rice research, resulting in a number of expensive irrigated schemes that struggle for sustainability along with an impressive number of technologies that have not reached rice farmers.

A food-security strategy for rice in West Africa needs to satisfy multiple aspects of food security. It must foster the supply of rice to meet the demands of urban and peri-urban populations that currently consume large quantities of imports (in most countries). At the same time, it must address food access by rural populations, many of whom cultivate rice for subsistence. Improved productivity of rain-fed rice could contribute substantially to the food security of the most rural and poor populations. In addition, trade is essential to the efficient distribution of food to deficit areas from surplus areas that have a competitive advantage for growing large volumes of rice. A food-security strategy for rice in West Africa therefore has three distinct but complementary components that will need to be balanced in a resource-constrained environment.

*First*, national value chain competitiveness strategies are required to ensure the supply of rice in the quantity and quality needed to effectively compete with imported rice in West Africa's urban markets. While varying in detail by country, national competitiveness strategies will largely be based on the creation of commercial networks characterized by concentrated areas of production (mostly irrigated), market-oriented farmers and significant investments in storage, processing and marketing. The establishment of these commercial networks implies a time-consuming process of building trust between value chain stakeholders so that mutually beneficial business models emerge. It also implies a

government policy shift to a more market-based approach to food security in which competitive markets ensure the supply of staple foods at the most competitive consumer price.

*Second*, national rural rice food security strategies focused on access to food are needed to improve productivity for the majority of more widely dispersed subsistence rice producers, mainly operating under rain-fed production systems. At its core, this strategy takes an incremental and partially subsidized approach to the introduction of basic production and post-harvest handling technologies—providing a demonstration effect for replication; as well as non-distortive approaches to developing links between subsistence farmers and a commercial input distribution system. Current disincentives to improved rice production will also need to be addressed, including insecure land tenure, dependency on government or donor assistance, and adverse cultural norms such as mistrust of the private sector, reticence to invest in food crops, gender-based constraints, etc. A combination of increased sales of cash crops and capital asset building (savings) will positively affect sustainability and the graduation of farmers from subsistence to market-oriented production. Such rural food security strategies should focus on a number of a different food crops important for nutrition and calorific intake, rather than on rice in isolation. (Indeed, in certain West African countries, rice is not a major component of rural diets and will not be part of this strategy.)

*Third*, a regional food security strategy focused on distribution is needed to facilitate rice flows and learning throughout the region. This facilitation will initially increase flows for imported rice that is already in the market and thus create a more competitive environment for local rice. However, regional trade improvements will eventually be needed to exploit competitive advantages within West Africa that facilitate trade from “centers of excellence” characterized by comparative advantages and the political and commercial will to upgrade, to the major deficit areas in the region. Moreover, shared learning (rather than just information exchange) will ensure that lessons in one country are applied elsewhere. Learning should include areas such as how best to promote sustainable input supply, how to address mistrust, and what technologies are most effective for drying, threshing and milling. Implementing this part of the strategy will necessitate addressing the dissonance between the pro-trade Comprehensive Africa Agriculture Development Programme (CAADP) compacts signed by many governments in West Africa and these same governments’ stated goal of national food self-sufficiency.

These three rice food security strategies complement each other and create synergies: combined, they will lead to dramatically increased local rice production sourced from a large number of suppliers and efficiently flowing throughout the West Africa region.

Finally, efforts need to be made by all stakeholders to rationalize the goals of food security and food self-sufficiency with the design of many current government and donor investments. Many post-crisis government interventions have undermined rather than built upon the private sector. Even in countries where liberalization policies have been in place for years, there remains a fundamental lack of trust in markets. At the same time, governments in the region have neither the resources nor the capabilities (as demonstrated by past efforts) to achieve substantial reductions in the need and demand for imported rice. Most donors and researchers would argue that working through the private sector is the most cost-effective strategy for generating the surpluses needed to replace imports. This strategy will have to be demonstrated before many governments in the region are ready to adopt it. Moreover, given the political nature of staple foods, strategists will need to identify reforms that meet the developmental and political objectives of governments and donors alike.



# I. INTRODUCTION

## A. BACKGROUND

In July, 2008, Congress approved special supplemental support for 2009 to help address the impact of high global food prices on developing countries. The Global Food Security Response (GFSR) framework, a response to the global food crisis, includes three components: i) an emergency humanitarian response; ii) urgent measures to address high food prices through agriculture and trade programs; and iii) a global policy agenda to address the systemic causes of high food prices. USAID's Development Assistance funds will be used largely to support urgent agricultural and trade measures, as proposed under the second component of the above framework. These include actions to increase agricultural productivity; alleviate transportation, distribution and post-harvest supply-chain bottlenecks; and promote sound market-based principles.

Under the GFSR, the Africa Bureau is commissioning value chain studies for staple foods in West Africa. These studies are motivated by a belief that solutions to the problems of food insecurity and rural poverty must go beyond agricultural production issues. The value chain approach addresses not only the tangible constraints of technology, finance and agricultural inputs but also the intangible constraints that affect the functioning of the market system and drive or impede behavior change. For example, in order to improve productivity, poor farmers must be willing to overcome their risk-aversion and change their practices, adopt new technologies and invest their scarce resources. Understanding constraints to improved productivity and competitiveness is critical to the GFSR effort. However analysis of constraints alone (which donor studies have focused on for many years) does not necessarily lead to change and improvement.

The goal of the value chain studies is to enhance food security by identifying actions that could be taken by USAID, other donors, host governments and the private sector to increase the production, processing and distribution of staple foods and the competitiveness of food staple value chains as well as to raise rural incomes in West Africa.

## B. FOCUS ON FOOD SECURITY

USAID defines food security as “when all people at all times have both physical and economic access to sufficient food to meet their dietary needs for a productive and healthy life.”<sup>1</sup> The definition focuses on three distinct but inter-related elements: food availability, access and utilization. For many people, food insecurity is transitory—seasonal, or temporarily caused by unexpected factors. But for vulnerable populations, even minimal abnormalities in the food production-distribution-consumption process can lead to asset depletion and chronic food insecurity.

**Greater food security will be achieved through a combination of**

- ***increased food availability***—resulting from higher yields, improved post-harvest practices and more efficient marketing;
- ***increased access***—due to stable prices and sustained increases in rural incomes through value chain growth, improved competitiveness and complementary economic activities; and
- ***improved utilization***—through processing technologies, cultivation of complementary crops, and improvements in the agricultural sector as a whole.

GFSR describes its 2010 Food Security Vision in terms of increasing agricultural growth and expanding staple food supply through improvements to staple food systems that cause markets to function more effectively. Effective staple

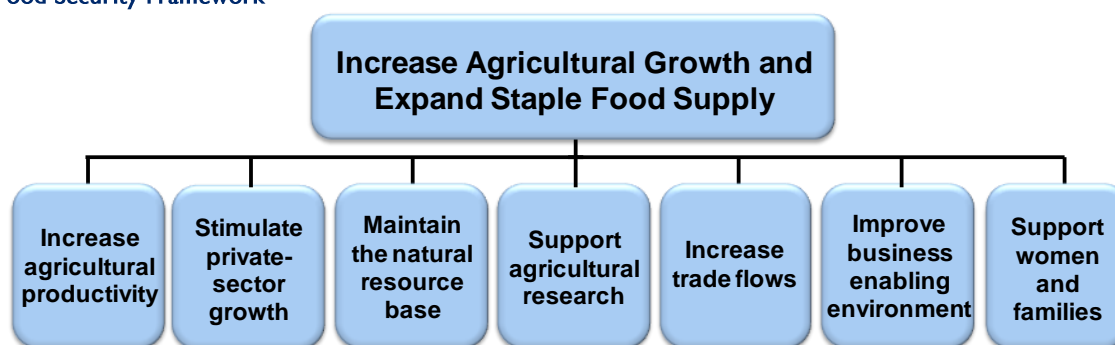
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<sup>1</sup> USAID, “Policy Determination 19.”

food markets provide the poor with greater access to food and stimulate the private investment needed to sustain the growth process and build resilience to economic shocks.<sup>2</sup> This vision of ending hunger in Africa requires working in a coordinated manner to stimulate rapid growth in the incomes of smallholder farmers and to expand the availability of staple foods in economically dynamic countries with a high prevalence of hunger, leading to powerful spillovers into the rest of the region and continent. The food security framework shown in figure 1 was articulated by Secretary of State Clinton in the form of seven principles in support of sustainable agricultural systems:

- i) increasing agricultural productivity by expanding access to quality seeds, fertilizers, irrigation tools, credit and training
- ii) stimulating the private sector by improving the storage and processing of foods and improving rural roads and transportation
- iii) maintaining natural resources, including helping countries adapt to climate change
- iv) supporting research and development and cultivating the next generation of plant scientists
- v) increasing agricultural trade
- vi) supporting policy reform and good governance
- vii) supporting women and families<sup>3</sup>

**Figure 1. Food Security Framework**



GFSR further outlines core principles that define the food security approach to development, including:

- Being African-driven, supporting African country and regional priorities and aligning with CAADP—Africa’s common vision and agenda to reform and revitalize African agriculture
- Building regional dynamism, synergies and spillovers to fundamentally change the imbalance in supply and demand of key food staples
- Engaging public and private multilateral development partners in Africa and internationally, and promoting public-private partnerships as a tool to support implementation
- Coordinating US government programs in order to ensure the greatest complementarity of efforts
- Integrating the objectives of inter-sectoral initiatives and cross-cutting themes (e.g., HIV/AIDS, gender)

**In keeping with the approach and principles outlined above, this report provides recommendations to increase the supply of rice through improved competitiveness of the value chain, and to improve access to food in other geographic areas that may not generate large supplies of rice but are important sources of food for rural populations.**

<sup>2</sup> Aker, “West African Experience with the World Rice Crisis 2007-2008.”

<sup>3</sup> Remarks at the 2009 World Food Prize Announcement Ceremony, Washington, DC, June 11, 2009.

Throughout this report, we seek to balance consumer demand for a low price/quality ratio for food with the need for incentives for farmers to invest in rice production, including the hundreds of thousands of smallholder farmers. Recommendations are considered in the context of CAADP as well as country and regional priorities. Special attention is paid to the enabling environment, to trade-related constraints and to the constraints and opportunities facing women.

## C. APPROACH AND METHODS

This study analyzes the rice value chain in the West African region<sup>4</sup> with special attention paid to the national situations in Ghana, Liberia, Mali, Nigeria and Senegal. Key questions for the study are as follows:

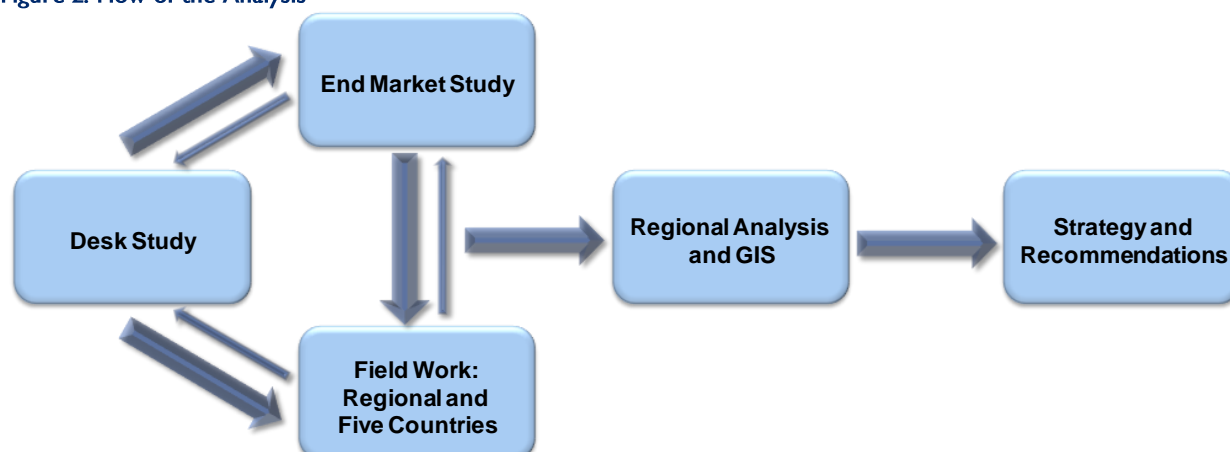
1. Where are the high-potential areas for rice production that should be the target for interventions to increase food security and rural incomes by raising production, yields, on-farm consumption and the marketed surplus?
2. Where are the key end markets within the region for marketed rice? What are the characteristics of demand in these markets, including consumer preferences? What are the competing sources of supply, including food aid? And what, as a result, are the challenges and opportunities in these end markets for West African suppliers?
3. What are the challenges and opportunities for trade in rice between areas of high production and areas of consumption, both within countries and across national borders?
4. What constraints in the business environment and/or along the value chain need to be addressed to increase the supply and availability of rice?
5. What competitiveness strategies should private-sector stakeholders adopt to increase productivity and improve competitiveness?
6. What interventions, actions or investments by USAID—within the CAADP framework—can have the greatest impact on food security and rural incomes? How can USAID support sustainable increases in rice value chain competitiveness? How can USAID help protect rural incomes over time in cases where the increased competitiveness of rice value chains marginalizes smallholder producers?

The study comprises a number of components that build on and inform each other: a desk study, end market study, field work, regional analysis and global information system (GIS), and strategy and recommendations. The flow of the analysis is shown in figure 2.

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<sup>4</sup> The West Africa region includes Benin, Burkina Faso, Cameroon, Chad, Côte d'Ivoire, The Gambia, Ghana, Guinea, Guinea Bissau, Liberia, Mauritania, Mali, Niger, Nigeria, Senegal, Sierra Leone and Togo. USAID also includes Cape Verde, which is excluded from rice statistics produced by the Africa Rice Center and is not considered in this report.

Figure 2. Flow of the Analysis



The **desk study** captures and codifies a breadth of data on the rice value chain, both regionally and at the country level (for Ghana, Liberia, Mali, Nigeria and Senegal). It identifies gaps to be addressed by field work. The desk output is not a traditional paper, but a detailed matrix and a series of summary briefs that were validated with key informants. The findings have been incorporated into this report. Key informants included staff from the Africa Rice Center,<sup>5</sup> the International Food Policy Research Institute (IFPRI), the Center for Global Development, Michigan State University, the Coalition for African Rice Development (CARD)<sup>6</sup> and field-based project implementing agencies.

The **regional end market study** includes both desk research and field interviews, and focuses on the identification of major regional markets, interviews with buyers in West Africa and elsewhere, analysis of competition in rice markets, and the decision making of consumers, retailers, wholesale traders and importers.

The **country-level field work** addresses the gaps identified by the desk study, focusing on systemic constraints to exploiting market opportunities. The country-level field work included analysis of the following:

- i) end markets—consumer behavior, market segments, competitive landscape, procurement mechanisms
- ii) business environment and the incentives and disincentives created for investing and upgrading
- iii) vertical coordination and the efficiency and effectiveness of firms in the chain to cooperate and compete constructively, capturing issues related to inter-firm relationships (trust, incentives, capacities and behavior)
- iv) aggregating strategy—the willingness of firms to cooperate horizontally in order to aggregate product, buy or sell in bulk, pool resources and otherwise improve efficiency, benefits and overall competitiveness
- v) capabilities and incentives or disincentives to invest in upgrading to exploit end-market opportunities—all along the value chain, but with particular attention on smallholder farmers
- vi) supporting markets—services needed to strengthen value chain capabilities and the profitability of service provision (including finance, extension and agronomic services and business services) given the business environment and the growth of, expected returns from and perceived risk in the value chain
- vii) value chain governance—analysis of which firms set and monitor the terms of transactions, are willing to invest in smallholder upgrading or institutionalize quality standards along the chain

<sup>5</sup> The Africa Rice Center is one of the 15 international agricultural research institutes supported by the Consultative Group on International Agricultural Research. Formerly known as the West Africa Rice Development Association (WARDA), the name of the institute was changed in 2009 in recognition of the Center's pan-African transformation.

<sup>6</sup> CARD is an initiative to support the efforts of African countries to increase rice production. It also forms a consultative group of donors, research institutions and other relevant organizations to work with rice producing African countries. It is supported by the Japan International Cooperation Agency (JICA) and the Alliance for a Green Revolution in Africa (AGRA).

An understanding of country-level opportunities and systemic constraints is used to offer a strategy for how to develop the rice value chain so as to increase supply, while addressing food insecurity among rural populations. The major findings of the five country-level studies have been incorporated into the body of this report. The studies are included as attachments.

The **regional analysis** incorporates GIS spatial analysis and maps into a synthesis of the desk and field work. The analysis focuses on a regional overview of the rice value chain, end-market opportunities and constraints, and opportunities for and constraints to regional trade.

The **regional strategy** includes a vision for how to advance food security in West Africa over the short, medium and long run through improvements in the productivity, competitiveness and trade of rice across West Africa. It suggests interventions and the sequencing of interventions needed to move the industry from its current state to one that is more productive and competitive and able to contribute to improved food security and rural incomes.

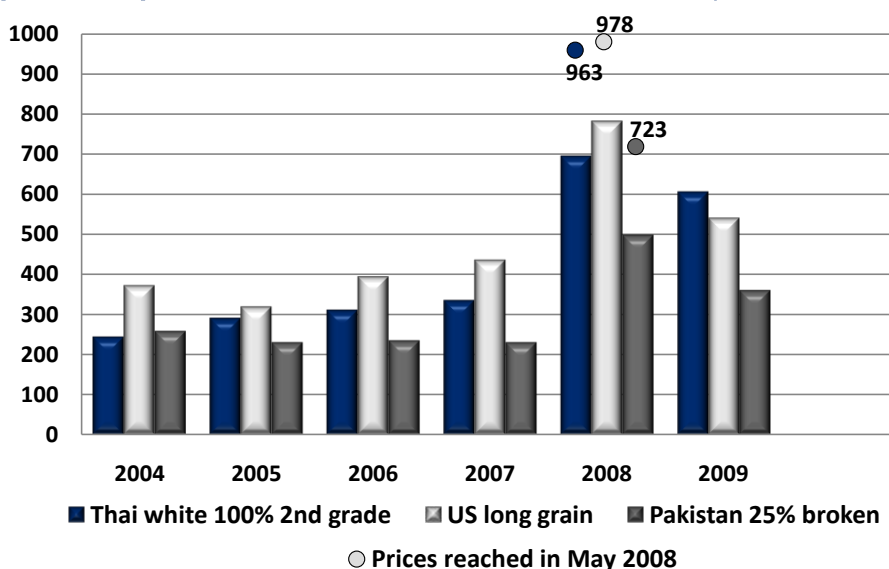
**Recommendations** for investments are given, based on the regional strategy, for the regional and country-level USAID missions to improve the competitiveness and inclusiveness of rice value chains, including increases in the production, productivity and trade of rice in the region.

## II. RICE IN WEST AFRICA

### A. INTRODUCTION

In most of West Africa, rice production has not been able to match the increases in demand triggered by population growth, rapid urbanization, increasing incomes and urban consumers' preferences in terms of cost and ease of cooking. As a result, the region relies on imports to supply half of its demand for rice. In the spring of 2008 world prices for rice tripled in less than four months and reached a 30-year, inflation-adjusted high (figure 3). While in the past, West African countries were able to afford price interventions to protect domestic rice consumers, this was not the case in 2008. With imports now a significant share of total consumption, it is no longer financially possible for African countries to isolate themselves from the world market. Indeed some argue that the price increase offers an opportunity for countries in the region to expand production without high tariffs or subsidies. Dirck Strycker maintains that "before the rise in world market prices, rice was profitable in some regions using some techniques. Now it should be profitable nearly everywhere."<sup>7</sup>

Figure 3. Average World Prices of Selected Rice Varieties, 2004-2009 (US \$/MT F.O.B.<sup>8</sup>)<sup>9</sup>



Source: FAO Rice Price Update.

According to Tom Slayton,<sup>10</sup> the world rice crisis of 2008 (unlike the "food crisis," which affected other grains and vegetable oils) took place during a period of record world production and fairly plentiful reserves. Slayton argues that the world rice market became volatile due to

- export restrictions by India and Vietnam
- rising oil and petrochemical prices

<sup>7</sup> Strycker, "Intervening in the World Food Markets."

<sup>8</sup> The F.O.B. price is defined as the price of goods on board a vessel designated by the buyer. The seller fulfills its obligations to deliver when the goods have passed over the ship's rail at a specified port.

<sup>9</sup> The bars indicate average prices in 2004-2008 and circles indicate prices in April 2009.

<sup>10</sup> Slayton, "Rice Crisis Forensics."

- a weaker dollar
- ill-considered government policies—especially panic buying in the Philippines
- growing speculation that prices were heading higher

Since their peak in May 2008, rice prices have receded, but remain high by historical standards due to continued export restrictions by Egypt and India as well as Thailand's rice mortgage scheme and huge government stocks. The price decline since May 2008 reflects large harvests in Asia, retreats in oil prices and dampening consumer demand associated with the world recession. Nevertheless, in the longer run, prices are likely to remain high and shortages and price spikes could recur.

Some people argue that while the food crisis of 2008 may have been triggered by the rising price of oil and bio-fuels and the weaker dollar, there were also longer-term trends that have affected rice and other foods. World population is currently 6.7 billion and, while the rate of increase has slowed, by 2050 it is expected to reach 9 billion. To keep pace, world food production will have to increase dramatically. Another long-term factor is the decreasing land area available for rice production in Asia as a result of urbanization, industrialization and economic factors. It has been estimated that by 2020, the rice-exporting countries in Asia will no longer be able to export due to increase in local demand and decreasing land availability.<sup>11</sup> In addition, Green Revolution technologies are almost exhausted for further productivity gains.<sup>12</sup> Population pressures combined with decreasingly available land and declines in yield increases could have contributed to the rising prices.

To date, increases in African food production, including rice, have been achieved largely through extending the area under cultivation. Unlike Asian countries, African countries have not invested in developing efficiencies that permit a low-cost rice system,<sup>13</sup> leaving them vulnerable to fluctuations in world markets. To keep pace with the rise in demand, intensification or improvements in yield are essential. Many economists hoped that the food crisis would create incentives for farmers to increase yields. Yet most of the increase in cereal production in 2008 came from developed countries. Increases in production in Africa mainly came, as in the past, from farming more land and not from greater yields.

An article in *The Economist* argues that uncertainty in world agriculture has deepened as a result of high oil prices that promote the use of grains for ethanol, and increased commercial investment in agriculture because of its recession-proof quality. Increased capital flows make it more difficult for farmers to calculate in advance the profitability of any one crop, so the area they plant tends to fluctuate from year to year. Further, in Africa, market signals are often confused by inappropriate government policies that keep prices low and/or ban exports.<sup>14</sup> That world rice prices are still higher than 2006 levels, even in a recession, suggests that the price spike was not just an isolated event but rather reflected a genuine mismatch between demand and supply. As populations increase, this mismatch is likely to grow unless there are drastic increases in productivity.

The reactions of **donors** to the “rice crisis” include the Emergency Rice Initiative for Africa, begun in June 2008 by the Africa Rice Center, the Food and Agriculture Organization of the United Nations (FAO), the International Fertilizer Development Center, Catholic Relief Services (CRS) and the International Fund for Agricultural Development. Urgent assistance will be provided to 11 pilot countries in 4 major areas: seed, fertilizer, recommended technologies,

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<sup>11</sup> Chaudhary, “Can Africa be the Future Rice Bowl for Asia?”

<sup>12</sup> Cassman, “Breaking the Yield Barrier.”

<sup>13</sup> Aker, “West African Experience with the World Rice Crisis 2007-2008.” “Research and extension, rural infrastructure, a stable marketing environment, and a broad base of consumer demand all depend to a greater or lesser degree on effective government investments and policies. Asian governments learned long ago how to provide these essentials if there were to survive and their economies to grow. Not a single West African country has sustained such investments and policies for more than a few years at a time.”

<sup>14</sup> “Whatever Happened to the Food Crisis?” *The Economist*, July 2, 2009



and post-harvest and marketing. Moreover, the Africa Rice Center, the International Rice Research Institute (IRRI), FAO and Sasakawa Global 2000 will play key roles in enhancing Africa's rice research capacity and facilitating access to important rice information and knowledge.<sup>15</sup> Joining these efforts, AGRA, the New Partnership for Africa's Development (NEPAD) and JICA announced the establishment of the Coalition for African Rice Development in May 2008 with the aim of doubling Africa's rice production in 10 years.

The reaction of *African governments* has been to reduce import duties on rice, ban exports and invest in local production, largely through input subsidy programs for the purchase of fertilizer, seeds and pesticides. Banning exports in the region has never been fully enforceable, and reductions in duties have large fiscal costs, are poorly targeted (since the poor do not consume the most rice, and traders do not necessarily pass on the savings to consumers) and hurt domestic producers.<sup>16</sup> Mali, Nigeria, Senegal and Ghana were among a larger number of West African countries that initiated border interventions to control supplies as well as subsidy programs to promote the local production of rice. The impacts of these programs are still being realized, though forecasts of the results of some of these actions are mixed. While investment in the rice sector is clearly needed, Peter Timmer, a renowned food policy expert, argues that many of the government rice initiatives focus almost exclusively on production to the exclusion of complementary initiatives in processing and marketing, which are so important to determining domestic rice prices.<sup>17</sup> Other rice specialists note that these initiatives have further concentrated primarily on irrigation infrastructure and rice research, resulting in a number of expensive irrigated schemes that struggle for sustainability along with an impressive number of technologies that have not reached rice farmers.<sup>18</sup>

## B. RICE CONSUMPTION

### I. CONSUMPTION OF RICE AS COMPARED TO OTHER GRAINS

More rice is consumed in West Africa than in other parts of the continent. Rice became an increasingly important part of the West African diet between 1960 and 1980 and has supplied 12-13 percent of calorie intake in the region as a whole since then.<sup>19</sup> It is the largest single source of calories in Côte d'Ivoire, Guinea, Guinea Bissau, Liberia, Senegal and Sierra Leone, and is also an important part of the diet in most other countries in the region.<sup>20</sup> In Burkina Faso, Cameroon, Chad, The Gambia, Ghana, Mauritania, Niger, Nigeria<sup>21</sup> and Togo, rice plays a relatively minor role in the diet countrywide, supplying less than 10 percent of daily calories, although it is increasingly becoming an important staple in the major cities of these countries (figure 4). There is some evidence that in certain countries, such as Burkina Faso, the urban poor spend more on rice than the more affluent<sup>22</sup>—possibly because of the ease of cooking in labor-constrained households. Coastal countries such as Sierra Leone, Guinea, Senegal, Côte d'Ivoire and Guinea Bissau consume 50 kg or more per capita annually, while Sahelian countries such as Burkina Faso, Chad and Niger con-

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<sup>15</sup> Ibid. Sasakawa Global 2000 is a collaborative effort between the Sasakawa Africa Association founded by the Nippon Foundation in the 1980s and the Global 2000 program of the Carter Center.

<sup>16</sup> World Bank. *World Bank Research Digest* 2008

<sup>17</sup> Aker, "West African Experience with the World Rice Crisis 2007-2008."

<sup>18</sup> Correspondence with Tom Remington, Principal Agriculture Advisor for CRS, August 2009.

<sup>19</sup> WARDA, *2007 African Rice Trends*, 2008, 70.

<sup>20</sup> Based on FAO data for 2003-05.

<sup>21</sup> Nigeria has low consumption per capita but because its population is nearly one-half of the region's total, it is the largest rice consumer in aggregate terms.

<sup>22</sup> Reardon, "Cereals Demand in the Sahel and Potential Impacts of Regional Cereals Protection."



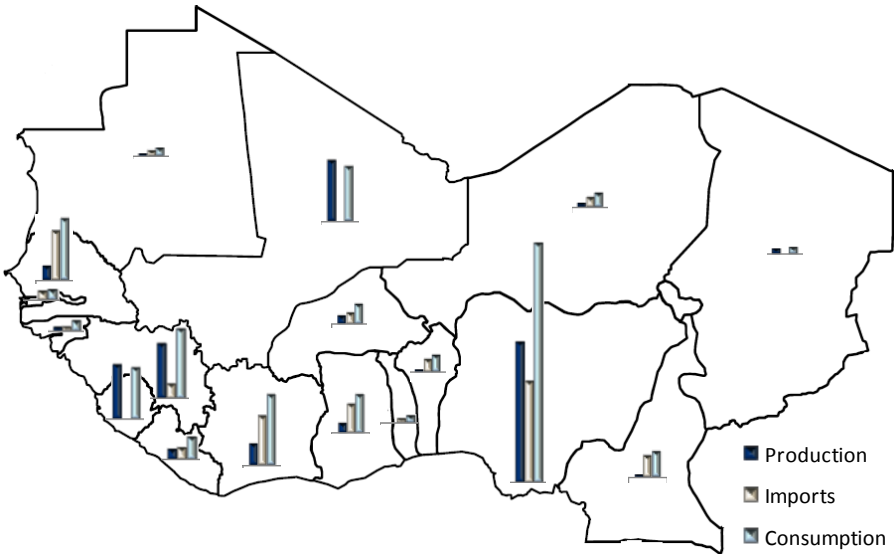
sume far less rice according to official statistics.<sup>23</sup> However, these data may overstate rice consumption in the coastal countries and understate it in the inland countries by failing to account for smuggling.<sup>24</sup>

Figure 4. Contribution of Rice to Calorific Intake in West Africa



Source: FAOSTAT data. Grain consumption excludes grain consumed in the form of beer.

Figure 5. Production, Imports and Consumption of Rice by Country



Source: Graphical representation of official FAO statistics (see table 1) as reported in the *Rice Market Monitor*.

<sup>23</sup> FAOSTAT data reported in WARDA (2008). Mali is an exception to this generalization, with per capita consumption of 20 kg.

<sup>24</sup> Ibid

Table I. Rice Production and Consumption in West African Countries<sup>25</sup>

Country	Population (millions)	Rice Produced (000 MT) <sup>i, ii</sup>	Rice Imported (000 MT) <sup>iii</sup>	Rice Consumed (000 MT) <sup>iii</sup>	Per Capita Rice Consumption (Kg) <sup>iv</sup>
Benin	9.6	60	250	310	31.62
Burkina Faso	15.5	155	220	374	12.99
Cameroon	19.4	59	410	485	12.29
Chad	11.5	116	30	144	7.32
Côte d'Ivoire	19.9	410	900	1,295	59.53
The Gambia	1.8	25	165	182	27.42
Ghana	24.5	184	540	713	26.97
Guinea	9.7	978	280	1,223	69.57
Guinea Bissau	1.8	99	86	185	57.45
Liberia	4.0	182	210	387	50.46
Mali	13.1	1,093	10	1,003	39.65
Mauritania	3.3	60	105	162	20.23
Niger	15.3	78	200	278	3.54
Nigeria	155.3	2,507	1,800	4,277	24.44
Senegal	13.0	258	900	1,138	72.54
Sierra Leone	6.2	960	20	930	81.35
Togo	7.0	48	90	137	15.51
<b>Total</b>	<b>330.9</b>	<b>7,272</b>	<b>6,216</b>	<b>13,223</b>	<b>18.33</b>

<sup>i</sup> Official FAO statistics as reported in the *Rice Market Monitor*. Production data represent end of the year 2008 harvests, which correlate with 2009 trade and consumption data.

<sup>ii</sup> Conversion factors to calculate milled rice from paddy volumes vary by country according to official FAO statistics. (Benin, Côte D'Ivoire, Mauritania, Nigeria and Sierra Leone use 60 percent; Ghana uses 61 percent; The Gambia, Liberia and Niger use 65 percent; Burkina Faso uses 66 percent; Guinea and Guinea-Bissau use 67 percent; Cameroon, Chad, Mali and Togo use 68 percent; and Senegal uses 70 percent.)

<sup>iii</sup> Official FAO statistics as reported in the *Rice Market Monitor*. Import and consumption data are 2009 projections.

<sup>iv</sup> Average annual per capita consumption data for 2000-2005, WARDA, 2007 *African Rice Trends*, 2008, p. 58.

Besides rice, West Africans also consume large amounts of corn (maize), millet and sorghum—collectively known as coarse grains. These coarse grains are consumed more in rural and inland areas; rice is consumed more in urban and coastal areas. (For more information on calories sources by country, see table 1 in annex I.)

## 2. TRENDS IN CONSUMPTION

Rice consumption in West Africa grew from an average of 1.3 million MT in the 1960s to nearly 6 million MT in the 1990s and almost 10 million by 2006.<sup>26</sup> Population growth accounts for much, but not all, of this increase: consump-

<sup>25</sup> The statistics used in this table and throughout the report are of variable quality. Available data sets are at variance with each other and are often also internally inconsistent. In table 1, for example, consumption data appears to be overestimated in the Rice Market Monitor, perhaps in part because of a failure to account for trans-shipments of imported rice to neighboring countries. Per capita consumption data are therefore given from a different source, the West Africa Rice Statistics Data Bank, which mainly uses the FAO statistical database (FAOSTAT Agriculture Data, <http://www.fao.org/>).

<sup>26</sup> WARDA. 2007 *African Rice Trends*, 58.

tion grew from 13 kg per person in the 1960s to 19 kg by 2006.<sup>27</sup> Population growth (which averaged 2.7 percent through the 1990s,<sup>28</sup> easing slightly to 2.6 percent between 2000 and 2005<sup>29</sup>) cannot explain the accelerated increases in rice consumption of the last few years. This seems rather to be principally the result of two factors: income growth and urbanization.

West Africa has seen little or no growth in per capita income for many years: during the 1990s, increases in some countries were offset by declines in others (table 2). Since 2000, however, annual per capita growth has averaged 2.6 percent for the region, with particularly high increases in Sierra Leone, Chad, Nigeria and Ghana. As household incomes rise throughout Africa, consumption tends to shift from coarse grains to rice.<sup>30</sup>

Furthermore, the urban population of West Africa has been rapidly increasing: for example, between 1996 and 2006, the urban population in Burkina Faso multiplied by a factor of eight.<sup>31</sup> Rice consumption in West Africa is tightly linked to increased urbanization in part due to its ease of preparation compared to coarse grains, which benefits smaller, labor-limited households.<sup>32</sup> Consumer and marketing surveys conducted in Bouake (Côte d'Ivoire's second largest city) and in 21 markets in major Nigerian cities confirm that rice has become an ordinary good for urban consumers, regularly consumed by all socio-economic groups.<sup>33</sup> Since 60 percent of West Africans are projected to live in urban areas by 2020 and the number of cities with more than 100,000 inhabitants will grow from 78 in 2006 to more than 200 in 2030, demand for rice from West African urban dwellers can be expected to continue to increase.<sup>34</sup>

**Table 2. Growth in GDP per Capita in West African Countries (Measured in US dollars, Year 2000)**

Country	Average Growth Rate		2007 Level (US \$)
	1991-2001	2001-2007	
Benin	1.4	0.4	353
Burkina Faso	2.0	2.2	259
Cameroon	-0.3	1.2	697
Chad	-0.8	6.7	259
Côte d'Ivoire	-0.8	-1.8	530
The Gambia	-0.1	1.5	363
Ghana	1.5	3.3	314
Guinea	1.2	0.8	394
G. Bissau	-1.4	-4.0	129
Liberia	1.0	-5.2	144
Mali	2.3	1.5	289
Mauritania	0.1	2.2	480
Niger	-1.4	0.3	170
Nigeria	-0.2	4.2	473
Senegal	0.5	1.6	531
Sierra Leone	-3.9	6.8	255
Togo	-0.8	0.2	249
<b>West Africa</b>	<b>-0.1</b>	<b>2.6</b>	<b>423</b>

<sup>27</sup> Ibid. For a breakdown of per capita consumption by country and year (from 1961 to 2006), see table 2 in annex I.

<sup>28</sup> Winter, "Land Tenure and Resource Access in West Africa."

<sup>29</sup> Atlas on Regional Integration in West Africa. OECD, <http://www.atlas-ouestafrique.org/spip.php?article220>

<sup>30</sup> Suresh Babu, Senior Research Fellow of IFPRI, quoted in *African Agriculture*, March 16, 2008

<sup>31</sup> IRIN, *Humanitarian News and Analysis*, June 8, 2009

<sup>32</sup> See, for example, <http://www.africancrops.net/rockefeller/crops/rice/index.htm>

<sup>33</sup> Lançon, "Quality and competitiveness of local and imported rice on West African urban markets."

<sup>34</sup> Johnson, "Regional Strategic Alternatives for Agriculture-led Growth and Poverty Reduction in West Africa."

### Who Suffers When Rice Prices Rise?

West Africa is one of the world's poorest regions. Three-quarters of the West African population are poor by international standards (earning less than US \$2 per day) and one-half is extremely poor (earning less than US \$1.25 per day).<sup>35</sup> While rice consumers and rice producers are both likely to be poor, poverty is far more prevalent in rural areas than in urban areas.<sup>36</sup> Due to low domestic production relative to demand, domestic rice prices are often linked to the price of imported rice and so global increases in rice prices benefit poor producers (if they have a net surplus) while harming poor consumers. In some countries in West Africa, rice growers typically produce only some of the rice they consume; in others, producers do not buy imported rice, switching instead to coarse grains and other staples once their rice harvest has been consumed. Therefore increases in rice prices may or may not negatively impact rural populations. Detailed market analysis in relation to purchasing power and local production is needed to quantify the net impact of price increases on specific rural populations.<sup>37</sup>

Urban dwellers unambiguously suffer when prices rise. The more of its rice supply a West African country imports, the worse the impact of price increases on poverty.<sup>38</sup> Price increases are most injurious, therefore, in the most import-dependent countries (Benin, Cameroon, Côte d'Ivoire, Ghana, Liberia and Senegal). In Liberia, for example, it has been calculated that a 20 percent rise in the price of rice would lead to an increase of three or four percentage points in the share of the population in poverty, "which is indeed a very large increase for a single commodity."<sup>39</sup>

## C. RICE PRODUCTION

### I. PRODUCTION VOLUMES IN WEST AFRICA

West Africa produced 7.2 million MT of milled rice in 2008.<sup>40</sup> The largest rice producer in the region is Nigeria, which accounted for 48 percent of the total that year. Between 2000 and 2008, production grew substantially in Sierra Leone (where a civil war ended), Burkina Faso, Mali, Benin, Niger, Chad and Senegal.<sup>41</sup>

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<sup>35</sup> The \$1.25 line is an up-dated version of the "dollar-a-day" measure of extreme poverty applied to earlier data, and represents an attempt by the World Bank to standardize the definition of poverty across countries in terms of purchasing power. Other poverty measures exist, such as the Ethical Poverty Line (an income threshold below which life expectancy falls rapidly as income falls, and above which life expectancy rises only very slightly with increased income), which identify a much higher percentage of West Africa's population as poor or extremely poor.

<sup>36</sup> See table 3 in Annex I.

<sup>37</sup> Food Crisis Prevention Network (RPCA), Food Security Information Note #27

<sup>38</sup> Ibid

<sup>39</sup> Tsimpo, "Rice Prices and Poverty in Liberia."

<sup>40</sup> Official FAO statistics as reported in the Rice Market Monitor.

<sup>41</sup> Rates of milled production increase were as follows: Sierra Leone 700 percent, Burkina Faso 177 percent, Mali 116 percent, Benin 102 percent, Niger 98 percent, Chad 83 percent and Senegal 82 percent.

Table 3. Rice Paddy Production (000 MT), 1961-2005 and 2001-2008

Country	Yearly Average (WARDA)					(FAO)	
	1961-1970	1971-1980	1981-1990	1991-2000	2001-2005	2001-2008	2008
Benin	2	11	8	23	64	68	99
Burkina Faso	35	39	41	77	92	107	235
Cameroon	13	35	71	44	51	74	87
Chad	32	37	39	98	123	121	170
Côte d'Ivoire	271	434	530	677	664	661	684
Gambia	34	29	27	21	25	26	38
Ghana	43	79	72	187	264	263	302
Guinea	258	398	614	946	1,150	1,224	1,466
Guinea Bissau	44	45	103	113	85	102	149
Liberia	141	235	279	123	112	176	280
Mali	165	183	220	563	849	970	1,608
Mauritania	1	4.5	35	67	75	78	99
Niger	22	31	57	63	73	76	120
Nigeria	264	533	1,758	3,114	3,139	3,378	4,179
Senegal	107	93	141	175	218	237	368
Sierra Leone	397	532	492	381	502	750	1,600
Togo	20	16	20	59	67	79	70
<b>West Africa</b>	<b>1,848</b>	<b>2,733</b>	<b>4,505</b>	<b>6,731</b>	<b>7,554</b>	<b>8,391</b>	<b>11,554</b>

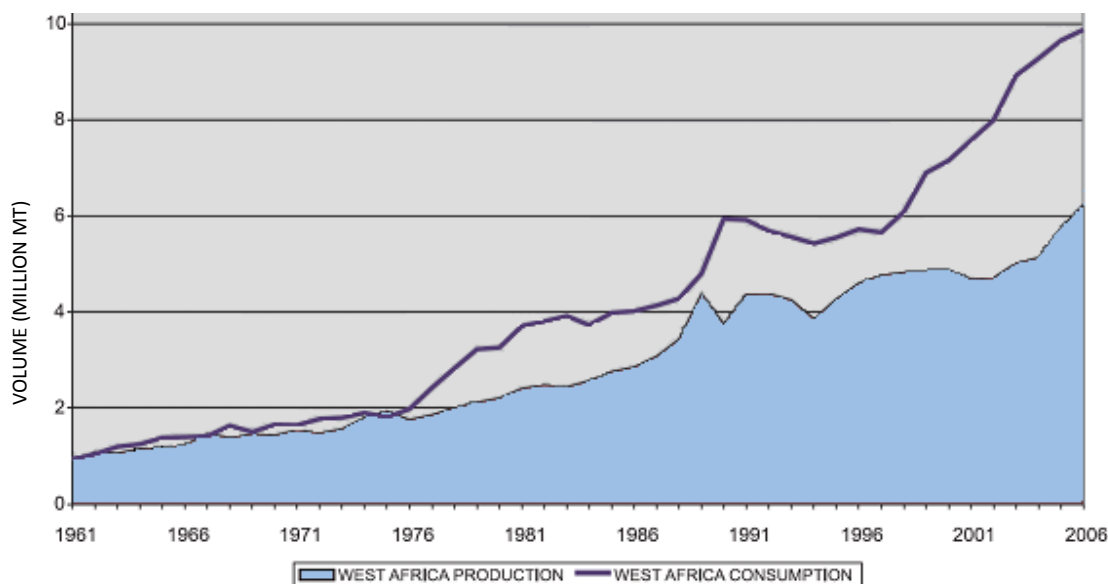
Source: 1961-2005 data are from WARDA, *2007 Africa Rice Trends*, 41; 2001-2008 averages and 2008 totals are official FAO statistics as reported in the *Rice Market Monitor*.

According to FAO statistics reported in the *Rice Market Monitor*, between 2000 and 2008, production of milled rice grew by 59 percent from 4.6 million MT to 7.2 million MT. Over the same period, consumption grew from 9.6 million MT to 13.3 million MT—a 38 percent increase. Rice statistics in West Africa are notoriously unreliable, however, and other analysts maintain that the gap between production and consumption is actually growing. Imports reached 6.3 million MT in 2008, equivalent to 48 percent of the region's rice requirements.<sup>42</sup> The region's self-sufficiency ratio (defined as the milled rice equivalent of paddy harvested during the calendar year divided by total human consumption) fell from 84 percent in the 1970s to 76 percent in the 1990s and 63 percent in 2006 (figure 6).<sup>43</sup>

<sup>42</sup> According to Aker, "West African Experience with the World Rice Crisis 2007-2008," for the period 2001-2005, rice production in West Africa increased at an average annual rate of 5.06 percent, as compared with an annual growth rate of 6.55 percent for rice consumption. Similarly, the Report of the Fifth External Program and Management Review of the Africa Rice Center claims domestic rice consumption is increasing at a rate of 8 percent per annum, surpassing domestic rice production growth rates of 6 percent per annum.

<sup>43</sup> WARDA, *2007 African Rice Trends*, 67. See also table 3 in Annex I. The difference between the 63 percent self-sufficiency and the regional supply of 52 percent of total rice requirements can be accounted for losses, rice used as seed or rice processed for purposes other than human consumption.

**Figure 6. Evolution of Rice Consumption in West Africa**



Source: WARDA, 2007 *African Rice Trends*.

While rice production in West Africa has more than doubled over the past 20 years, this is largely because of expansion of the harvested area, which has risen by 4.8 percent a year in recent years, and is estimated to have reached 5,827,000 hectares in 2007.<sup>44</sup> Although yields for irrigated and lowland rice production have seen some increase, overall average yield has barely increased: from 1.3 MT per hectare in 1984 to 1.6 MT per hectare in 1999/2003.<sup>45</sup> Indeed, new lands opened for planting are often less suitable for rice cultivation than previously cultivated lands; consequently, increases in the acreage planted have often coincided with falling yields per hectare. In 2001-2005 this occurred in Cameroon, Chad, The Gambia, Mauritania and Sierra Leone.<sup>46</sup> Only Nigeria and Senegal showed substantial growth rates for both areas planted and yields during this period.<sup>47</sup> However, average yields obscure the significant variations among different production systems and geographic areas. Impressive yields have been obtained in some areas: rehabilitated plots in Mali's Office du Niger typically yield 4.5 MT per hectare, and in the Senegal River Valley, this figure rises to 5-6 MT per hectare.

## 2. RECENT TRENDS IN PRODUCTION

According to the Africa Rice Center, the region's paddy production rose from an average of 6.7 million MT in the 1990s to 9.3 million MT in 2006. Further increases occurred in the following two years with 2008 paddy production reaching 11.5 million MT.<sup>48</sup> Significant increases in production in West Africa appear to be essential in the near term since global production is slowing. The FAO estimates that global production rose by only 1.8 percent in 2008.<sup>49</sup> The reasons for this lie in Asia, which produces 70 percent of the world's marketed rice: with rising prosperity, farmers' interest in growing rice is declining, potentials for further raising productivity in well-watered environments may be

<sup>44</sup> Rodenburg, "Potential of Herbicide-Resistant Rice Technologies for Sub-Saharan Africa," 27.

<sup>45</sup> Kush, "Center-Commissioned External Review on Integrated Genetic and Natural Resources Management."

<sup>46</sup> Ibid

<sup>47</sup> WARDA, 2007 *African Rice Trends*, 9.

<sup>48</sup> Official FAO statistics as reported in Rice Market Monitor

<sup>49</sup> UN News Centre, 2 April 2008

approaching exhaustion, and prospects for raising yields in less favorable environments, although great, will take some time to be realized. Combined with rising transport costs over time, this represents an opportunity for many West Africa countries to progressively replace imports with domestic production.

Increasingly, middle income countries such as Libya, China and Thailand, as well as high income countries such as Saudi Arabia, the Netherlands and the UK, are buying or leasing large tracts of land in West Africa for rice production. In Mali, President Amadou Toumani Touré sold 100,000 hectares of land in the country's main rice producing area to Libya as part of a larger infrastructure investment project. A Chinese firm has been contracted to supply hybrid rice seeds for the project and to provide training.<sup>50</sup> Libya also invested US \$30 million in a rice project in Liberia that it will manage in partnership with a local NGO on 15–17,000 hectares of land that the NGO received from the Liberian government.<sup>51</sup> The Dutch Agricultural Development and Trading Company has signed a deal to begin rice production in the Taraba region of Nigeria, which is expected to make Taraba State Nigeria's largest producer of rice.<sup>52</sup> Similarly, Lonrho, a London-based conglomerate, announced in January 2009 that it was in talks with the Malian government for a 25,000-hectare rice project in the Office du Niger.<sup>53</sup> Such large-scale acquisitions of farmland in Africa are controversial, with opponents seeing them as “land-grab deals” that threaten national sovereignty and domestic food security and supporters viewing them as opportunities to draw much needed resources into agriculture.

Governments, NGOs and private companies are all investing in the rice value chain to help meet the growing demand for rice in the region with local, sustainable production. For example, CARD aims to reduce Africa's reliance on imports by increasing production through the development and dissemination of new rice varieties to the continent's smallholder producers. It will also fund investments in agricultural research, post-harvest technology, irrigation construction and maintenance, and market information for grain traders.<sup>54</sup> Ambitious targets have been set to double African rice production between 2008 and 2018. This implies an annual average growth rate of 7.2 percent.

NEPAD's Comprehensive African Agriculture Development Program has set a target of 6 percent for annual growth in rice production. It also commits African countries to achieving the first millennium development goal of halving the prevalence of poverty by 2015. Most West African countries have formulated a rice development plan within the CAADP framework.

As part of the Emergency Rice Initiative for Africa, USAID is providing US \$5.1 million for two years (2009 and 2010) to boost rice production in Ghana, Mali, Nigeria and Senegal by a total of 30,000 MT of paddy rice. This program aims to provide certified rice seed and mineral fertilizer inputs to 40,000 vulnerable farm families and disseminate technologies through on-the-job training, videos, rural radio and TV broadcasts.

### 3. PRODUCTION COST COMPARISON WITH OTHER COUNTRIES

Data on the costs of production in rice producing countries are very limited. Furthermore, the complexity of different ecologies, multiple types and qualities of rice, and distortions resulting from government interventions mean that direct comparisons of rice productivity and cost in West Africa and other major producing areas such as Asia and the US are extremely problematic. However, as figure 7 illustrates, farm-gate prices in West Africa are typically higher than those in South East Asia. Within West Africa, costs of production vary greatly: while it is three times more ex-

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<sup>50</sup> Graham-Ranger, “Global rice land grab.”

<sup>51</sup> Cheetah Index, “\$30m Libyan Investment in Rice Growing for Liberia.”

<sup>52</sup> TradeInvest Nigeria. “Foreign firm ready to start with rice production in Taraba.”

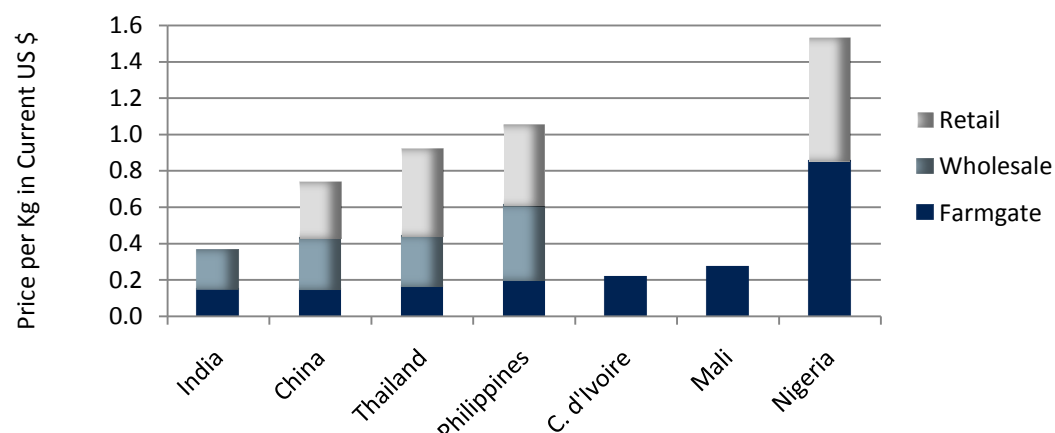
<sup>53</sup> Burgis, “Lonrho secures rice land deal in Angola.”

<sup>54</sup> Ekwuruke, “Coalition for African Rice Development Launched.”; Hanai, “Coalition for African Rice Development (CARD) and JICA's Co-operation for Rice Promotion in Africa.”



pensive to produce rice in Niger than in Thailand, Senegal has relatively low production costs.<sup>55</sup> (However, Senegal's low costs of production are largely attributable to government investments in capital-intensive irrigation schemes, input subsidies and the fact that land is not privatized.)

**Figure 7. Rice Marketing Margin Comparison, Selected West African and South East Asian Countries, 2005**



Source: All price data from the International Rice Research Institute World Rice Statistics, July 2008.<sup>56</sup>

Meta-research conducted by the Africa Rice Center<sup>57</sup> found that not all countries producing rice in West Africa were doing so at socially profitable or economically competitive levels.<sup>58</sup> The countries deemed to have the greatest potential for translating their natural resources into a competitive advantage in rice production are Mali, Sierra Leone, Nigeria and Burkina Faso. Other countries were found to be less competitive.

## 4. PRODUCTION SYSTEMS AND YIELDS

**Table 4. Rice Production Systems, Areas and Yields in West Africa**

Production System	Area under Production (000 Ha)	Percentage of Area by Ecosystem	Percentage of Total Rice Production	Yield (MT/Ha)
Upland rice	2,208	38%	24%	1.04
Rain-fed lowlands	2,005	34%	21%	1.02
Irrigated	874	15%	38%	4.19
Deep water/mangrove swamp	740	13%	16%	2.08
<b>Total</b>	<b>5,827</b>			

Source: Rodenburg, "Potential of Herbicide-Resistant Rice Technologies for Sub-Saharan Africa," 27.

<sup>55</sup> Diagne, "Opportunities for Collaboration between SLU and the Africa Rice Center (WARDA)."

<sup>56</sup> Farm-gate price data are for paddy. Wholesale and retail price data are for milled rice. Retail prices for India, Côte d'Ivoire and Mali, and wholesale prices for Côte d'Ivoire, Mali and Nigeria were not available.

<sup>57</sup> Akande, "Rice Policy in Africa: What Went Wrong."

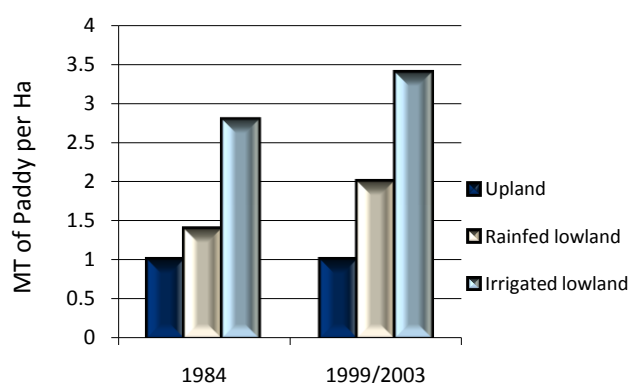
<sup>58</sup> In a protected environment, production can be privately profitable but socially inefficient.



Approximately 70 percent of West Africa’s 20 million rice farmers grow **upland** rice.<sup>59</sup> Upland rice production requires lower labor input and generally produces lower yields. Over the last 20 years, yields rose in rain-fed and irrigated lowland environments but remained very low in upland environments, averaging about 1 MT per hectare. Small-scale farmers in the uplands (the majority of whom are women) do not usually have access to irrigation and farm in highly variable conditions in bush-fallow systems. Upland cultivation has been praised for maintaining local biodiversity<sup>60</sup> although slash-and-burn practices are widely used, primarily in the humid forest zone. Furthermore, population pressure in some areas has forced upland rice farmers to drastically reduce fallow periods<sup>61</sup> or expand cultivation onto marginal soils—increasing erosion and degrading soils, and leading to significantly reduced yields.<sup>62</sup> Nevertheless, if drought-tolerant rice varieties can be effectively disseminated, upland rain-fed areas may be a major area of gain in output, with significant impact on food security.

**Rain-fed lowlands**, consisting of the coastal plains, inland basins, river flood plains and inland valleys, are vulnerable to floods and, to a lesser degree, droughts. Water control technologies, which can significantly increase yields, tend to be adopted in areas of land pressure and close to urban markets, particularly if investment in such technologies increases land tenure security.<sup>63</sup> The introduction of inputs and improved practices such as bunding<sup>64</sup> can mitigate problems with topsoil erosion and nutrient mining of the soils. It has been estimated that from 1984 to 1999/2003 rain-fed lowland yields increased by 43 percent (figure 8)—although other analysts suggest that these increases reflect improvements in particularly successful growing areas, rather than the region as a whole, and that yields have been stagnant since the early 1990s.<sup>65</sup> With only an estimated 10–25 percent of lowlands currently under agricultural cultivation, the potential to expand production within this ecology is significant.<sup>66</sup>

**Figure 8. West Africa Rice Yields by Production System, 1984 and 1999/2003**



Source: Kush, Gurdev Toshiyuki Wakatsuki and Glitho Isabelle Adole. “Center-Commissioned External Review on Integrated Genetic and Natural Resources Management.”

<sup>59</sup> Harsch, “Farmers embrace African ‘miracle’ rice,” 10.

<sup>60</sup> GRAIN. “Nerica—another trap for small farmers in Africa.”

<sup>61</sup> West Africa Rice Development Association (Africa Rice Center). “West Africa Rice Research Brief No. 2.” Between 1984 and 1994, the average length of fallow in the forest zone dropped from 14 to 5 years.

<sup>62</sup> Ibid. Four years of diagnostic trials in over 500 farmers’ fields across Côte d’Ivoire indicated that this reduction in fallow length was associated with a 20–30 percent yield reduction.

<sup>63</sup> Sakurai, “Intensification of Rain-fed Lowland Rice Production in West Africa: Present Status and Potential Green Revolution.”

<sup>64</sup> Bunding refers to the construction of earth ridges along the edges of fields to impede the flow of water.

<sup>65</sup> See for example Lançon, “Potential and prospects for rice production in West Africa.”

<sup>66</sup> Sakurai, “Adoption of Modern Rice Variety and Water Control Technology in West Africa’s Rain-fed Lowland.”

**Irrigated** production takes place in limited parts of West Africa: nearly all the rice grown in Mauritania is irrigated, while dry-season irrigated production also occurs in parts of Cameroon, Niger, Mali and Burkina Faso.<sup>67</sup> Impressive yields can be achieved using irrigation. In Mali's Office du Niger, for example, investments in large-scale, gravity-fed irrigation infrastructure (together with improvements in the business environment) have led to an increase in the total value added<sup>68</sup> from rice production by an average of 9.3 percent per year—the highest increase for any agricultural crop. However the problems with maintaining and operating irrigation schemes are numerous and vary by location. In Nigeria, significant government investment in irrigation has produced few results due to poor planning, weak infrastructure management and inadequate funding for operations and maintenance. Constraints identified by the government include alkalinity, salinity, nitrogen use inefficiency, iron micronutrient toxicity, poor disease and pest management, low levels of mechanization, lack of involvement of farmers, extreme temperatures, lack of access to inputs and credit and population factors (including migration, an aging population and high incidence of HIV/AIDS and malaria). In Ghana, the possibility of achieving increases in production from irrigation is constrained by legal complications in control over irrigated land and infrastructure.

Other rice ecologies include *mangrove swamp* and *deep water*, among others. Mangrove swamp rice is cultivated in Sierra Leone, The Gambia, Guinea and Guinea Bissau. Although this ecology can sustainably support relatively high yields, its share of the regional rice area is likely to decline as labor costs and environmental concerns rise.

It appears that both irrigated and rain-fed production offer opportunities for improving food security and maximizing competitive production, and that the potential of one production system *vis-à-vis* another varies by country. In many countries, rain-fed lowland areas are largely undeveloped and have the potential for increased yields. In Liberia, lowland rice production requires greater land preparation initially than upland rice, which currently serves as a disincentive to expanded lowland cultivation. But with proper maintenance, the labor requirement decreases over time. In Nigeria, rain-fed lowland systems have been shown to produce similar yields to those currently achieved in irrigated areas, and lowland rice production has lower infrastructure costs relative to irrigated rice. In addition, producers can be encouraged to use residual moisture for the cultivation of nutritious rotation crops in the off-season for rice. In Ghana, energy-efficient pumps—part of the shift from more labor-intensive to more capital-intensive production—present an opportunity for adding a second season to rain-fed rice production. In many countries, however, lowland rice production is dispersed over wide geographic areas, making the aggregation process difficult and expensive. The market potential of rain-fed lowland production largely depends on transport costs.

In other countries, such as Senegal and Mali, irrigated rice yields are consistently 2-3 times those obtained in rain-fed production systems. Irrigation, being less dependent on uncontrollable weather conditions, is the preferred investment for the private sector. Due to its economies of scale, irrigated production seems to be the best system for producing for and penetrating the urban quality rice market currently served by imported rice. (Upland rice supply is scattered and, hence, variable in quality.) The concentration of irrigated production creates volumes that justify investments in processing and storage. As with rain-fed production, irrigation also allows the diversification of production through the cultivation of various off-season crops.

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<sup>67</sup> West Africa Rice Development Association (Africa Rice Center). “Promising Technologies for Rice Production in West and Central Africa.”

<sup>68</sup> Value added is the difference between the value of a sector's output and its inputs from other sectors. It is an accurate measure of a given activity or sector's contribution to GDP—correcting for double counting due to inputs purchased from other sectors.

## D. RICE TRADE

### I. IMPORTS INTO WEST AFRICA

With demand outstripping production gains, West Africa is a major and expanding rice import market. West Africa buys approximately 20 percent of the world's rice exports, amounting to 6.3 million MT in 2008. Import data for the Economic Community of West African States (ECOWAS) countries are displayed in table 5. Top importing countries in the region include Senegal, Nigeria and Côte d'Ivoire, although data on imports into Nigeria are both incomplete and inaccurate.

**Table 5. Rice Imports by Country (000 MT), 2004-2007<sup>69</sup>**

Importers	2004	2005	2006	2007
Benin <sup>a</sup>	208	378	731	933
Burkina Faso	14	11	12	13
Côte d'Ivoire	715	808	903	809
The Gambia	60	40	25	103
Ghana	711	393	390	308
Guinea	130	111	257	296
Guinea Bissau	50	60	30	27
Liberia	197	135	208	149
Mali	105	272	180	137
Niger	187	292	187	174
Nigeria <sup>b</sup>	2,300	1,800	1,900	2,000
Senegal	823	1,252	706	1,056
Sierra Leone	20	109	126	75
Togo	59	81	N/A	79
<b>ECOWAS Total</b>	<b>3,492</b>	<b>3,974</b>	<b>6,335</b>	<b>4,805</b>
<b>World Total</b>	<b>26,663</b>	<b>27,868</b>	<b>30,408</b>	<b>30,319</b>

*Source:* International Trade Center (ITC) calculations based on UN COMTRADE data; accessed using ITC's TradeMap ([www.trademap.org](http://www.trademap.org)).

<sup>a</sup> Benin 2005-08 data are inflated by imports intended for smuggling into Nigeria.

<sup>b</sup> Nigeria data are not available from UN COMTRADE for 2004 and 2005 and are questioned by experts for 2007 and 2007. The data used here are from the FAO's *Rice Market Monitor*, which are inflated by estimates of trans-shipments from Benin and Cameroon.

Rice offered in the market is not a homogenous commodity. Rather it consists of a wide range of rice products that vary according to aroma, level and nature of processing (brown, white, polished, parboiled, flour), grain length and kernel shape (slender long-grain *Indica*, medium grain, or round grain *Japonica*), percentage of broken grains, color, chalkiness and translucency, homogeneity and cleanliness, freshness, dryness, taste and starch level, cooking qualities (e.g., swelling capacity, cooking time, stickiness) and branding and packaging (bulk versus packaged).

Most imported rice is either broken or milled rice. Commercial imports of husked brown rice are minimal, limited mainly to Nigeria. Nigeria and Liberia are importers of parboiled rice. Senegal, Gambia, Mauritania and Mali are principally buyers of 100 percent broken rice and most of the other countries are white rice buyers. (Côte d'Ivoire and

<sup>69</sup> Cape Verde has been omitted.

Ghana are the most diverse importers, buying various qualities of white rice—both high and low quality, aromatic rice and aromatic broken.)

The FAO estimates that West African imports peaked at just under 6.6 million MT in 2007 and dropped by 200,000 MT last year in the face of near-record world prices, more restrictive trade financing resulting from the global financial crisis, and a drawdown in carryover stocks. While world prices have fallen considerably in 2009, values remain relatively high (both compared to historical levels and to the price of local foodstuffs). This, combined with the continued effects of the global recession on trade financing (see text box), the current year's high production volumes and the hangover of expensive inventories in some markets, is resulting in a further contraction in African import demand in 2009. The FAO is currently forecasting that West African imports will decline to 6.25 million MT this year.

The largest exporter to the region is Thailand, but China, India and the United States have also been important sources of rice imports for particular West African countries at various times.<sup>70</sup> Only about 7 percent of world rice production is traded internationally and the top four exporting countries in Asia (Thailand, India, Vietnam and Pakistan) account for 70 percent of world trade, with the US representing 12 percent of the total and the rest of the world 18 percent.<sup>71</sup>

The volatility in world rice prices and the financial crisis of the last two years has made many banks more cautious about their exposure to the world rice market—a caution that has been heightened by the recent bankruptcy of Ascot Commodities, one of the major international rice trading companies that was active in the African market. European-based banks, which are most active in financing rice trading in the continent, have become more conservative in financing both local importers and the medium- and smaller-sized international firms specializing in shipping rice to Africa. In addition, earlier credit lines levels cover smaller volumes at today's relatively high price levels.

## 2. SELF SUFFICIENCY

Self-sufficiency in food staples in general, and in rice in particular, is a politicized issue in West Africa. The Senegalese Minister of Agriculture, Amath Sall, for example, announced that “by 2012, Senegal will not import a single grain of rice.”<sup>72</sup> Comments made to the BBC in 2002 by Peter Harold, then-World Bank Resident Director in Ghana, concerning Ghana's lack of competitiveness on the world market for rice led to accusations of “a ploy by the west to demoralize Ghanaian farmers in order to continue flooding the market with foreign rice.”<sup>73</sup> Similarly, NEPAD's Sub-Regional Business Forum on Rice considers self-sufficiency in food production to be an essential aspect of national sovereignty.<sup>74</sup> Self-sufficiency in rice production, it is argued, will reduce consumer food prices, create the stability and economic opportunity for on-farm diversification into higher value crops and off-farm job creation, and save approximately US \$2 billion annually in hard currency.<sup>75</sup>

Nevertheless, self-sufficiency is not necessarily an appropriate policy goal for individual countries within the region;<sup>76</sup> although rising oil prices, global warming<sup>77</sup> and slowed growth in exports from Asia suggest that regional self-

<sup>70</sup> See tables 5 to 9 in Annex I for detailed data by country, year and type of rice (unhusked, brown, milled or broken).

<sup>71</sup> USDA as quoted in *Rice Today*, IRRI, 2009. See also Aker, Jenny et al. “West African Experience with the World Rice Crisis 2007-2008”.

<sup>72</sup> Pambazuka News. “West Africa: “Senegal self-sufficient on rice by 2012.”

<sup>73</sup> Safo, “Ghanaians feat on 30,000 metric tones of rice.”

<sup>74</sup> “Food Crisis In West Africa” Concept Paper. Sub-Regional Business Forum on Rice.

<sup>75</sup> IITA. “Bountiful rice harvest from ‘Sawah’ system.”

<sup>76</sup> Bockman, “New Rice Strain Gives New Hope to Senegal's Farmers.”

<sup>77</sup> An average daily temperature increase of 1 degree Celsius resulted in a 10 percent reduction in rice yields at the International Rice Research Institute Farm in the Philippines, according to a 12-year study. CBSNews, “Global Warming Hurts Rice Yield,” June 28, 2004

sufficiency is an appropriate long-term goal. The degree of self-sufficiency that should be aimed for at the country level depends on two basic factors: the cost of expanding domestic rice production and the level of world rice prices. The volatility of rice prices makes this a difficult but necessary assessment.

**Figure 9. West Africa Rice Self Sufficiency Map 2006**



Source: Correspondence with Tom Slayton<sup>78</sup>

As might be expected, the price spike of 2008 led to stepped-up funding for rice-related research, extension and irrigation infrastructure. It also appears to have prompted rethinking by governments about genetically modified rice.<sup>79</sup> The FAO estimates that the total area under rice cultivation rose by 6 percent in West Africa in response to the higher prices and government support programs, and that this expansion, together with very favorable weather conditions, is likely to bring paddy production in the region to 11.4 million MT for the 2008/2009 season—a 28 percent increase over the previous year.<sup>80</sup> In addition, large stocks of rice are being held by government institutions and private traders. Many traders who bought rice at US \$700 per MT are not yet willing to sell at a loss, which makes 2009/2010 world price behavior difficult to predict. International rice prices are expected to fall as these stocks are off-loaded. In May 2009, benchmark Thai white 100 percent B grade rice fell to US \$525 per MT as a result of thin demand and abundant supply further boosted by sales from the Thai government's stocks.<sup>81</sup> Further price reductions could increase access to cheap rice for urban populations in West Africa, but they are also likely to have a deleterious effect on local production unless governments intervene through tariffs and other forms of protection.

### 3. FOOD AID

Most rice imports are on commercial terms, but all West African countries except Mali and Nigeria received food aid in 2007, which is the latest year for which data are available. Total rice shipments under food aid programs in that year were reported to be 115,920 MT, with Niger, Senegal, Côte d'Ivoire, Burkina Faso, Guinea and Mauritania the largest

<sup>78</sup> According to the data, Niger, Guinea and Sierra Leone produce more rice than they consume. However, only Niger exports significant volumes. This suggests one or a combination of the following: the statistics overestimate production or underestimate consumption, or there are significant volumes of rice traded informally within the region.

<sup>79</sup> Slayton, "Rice Crisis Forensics: How Asian Governments Carelessly Set the World Rice Market on Fire." 30.

<sup>80</sup> Food and Agriculture Organization of the United Nations. *Rice Market Monitor*, 13.

<sup>81</sup> Reuters, May 20, 2009

recipients.<sup>82</sup> This represents less than 3 percent of rice imports and about 2 percent of rice consumption—too little to create major market distortions for the region as a whole, although localized impact could be significant in some areas.

Through a long history of food aid donations through Food for Peace, Food for Progress, Title I and Food for Education, U.S. rice has a good reputation in West Africa. However, the current price and tariff structure will continue to favor imports of broken rice in countries such as Senegal, Gambia, Sierra Leone, Mali and Mauritania, which import non-aromatic broken rice.<sup>83</sup>

#### 4. EXPORTS FROM WEST AFRICA

Official West African rice exports are negligible. According to the UN COMTRADE data, total exports by West African countries in 2007 were approximately 103,000 MT valued at US \$32 million of which 73 percent was broken rice, 17 percent was milled and polished, 9 percent was brown, and less than 1 percent was paddy. Of this total, only 24,000 MT was exported out of the region, almost all of it by Niger.<sup>84</sup> Other data sets show little to no rice being exported from the region.<sup>85</sup>

#### 5. INTRA-REGIONAL TRADE

Figure 10 depicts the pattern of rice trade flows in West Africa. Several observations can be made. First, rice flows throughout every corner of West Africa. Second, almost all of the cross-border rice trade flows are of imported rice, both through formal transit shipments of rice from the main ports and through informal trade. The latter is very significant: For example, as much as 800,000 MT of rice are formally imported into Benin in some years, but the bulk of these imports are parboiled rice which enters the Nigerian market through informal channels. Third, almost all the trade from surplus areas to urban markets remains within the country of production due to sufficient domestic demand, high transport costs and customs formalities. In 2007, recorded exports to other countries within the West African region totaled less than 79,000 MT, principally from Senegal, Ghana, Côte d'Ivoire and Togo. Outside of parboiled rice trans-shipped via Cotonou to Nigeria, reliable estimates of volumes traded informally are elusive. Informal exports of West African rice are mostly from production locations close to borders. For example, there are some exports of domestic rice from the Senegal River Valley to Mauritania, where rice prices are higher.

The largest rice-deficit countries in West Africa in 2006 (measured as a share of total consumption) were Benin, Cameroon, Côte d'Ivoire, Ghana, Liberia and Senegal. Most imported rice is consumed in the coastal regions, especially in the larger cities. In rural areas, the drier regions often experience major rice deficits.<sup>86</sup>

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<sup>82</sup> For a breakdown of food aid volumes by country, see table 10 in annex I.

<sup>83</sup> USDA Foreign Agricultural Service, Global Agriculture Information Network (GAIN) Report, 2 July 2007 and correspondence with Tom Slayton, August 2009.

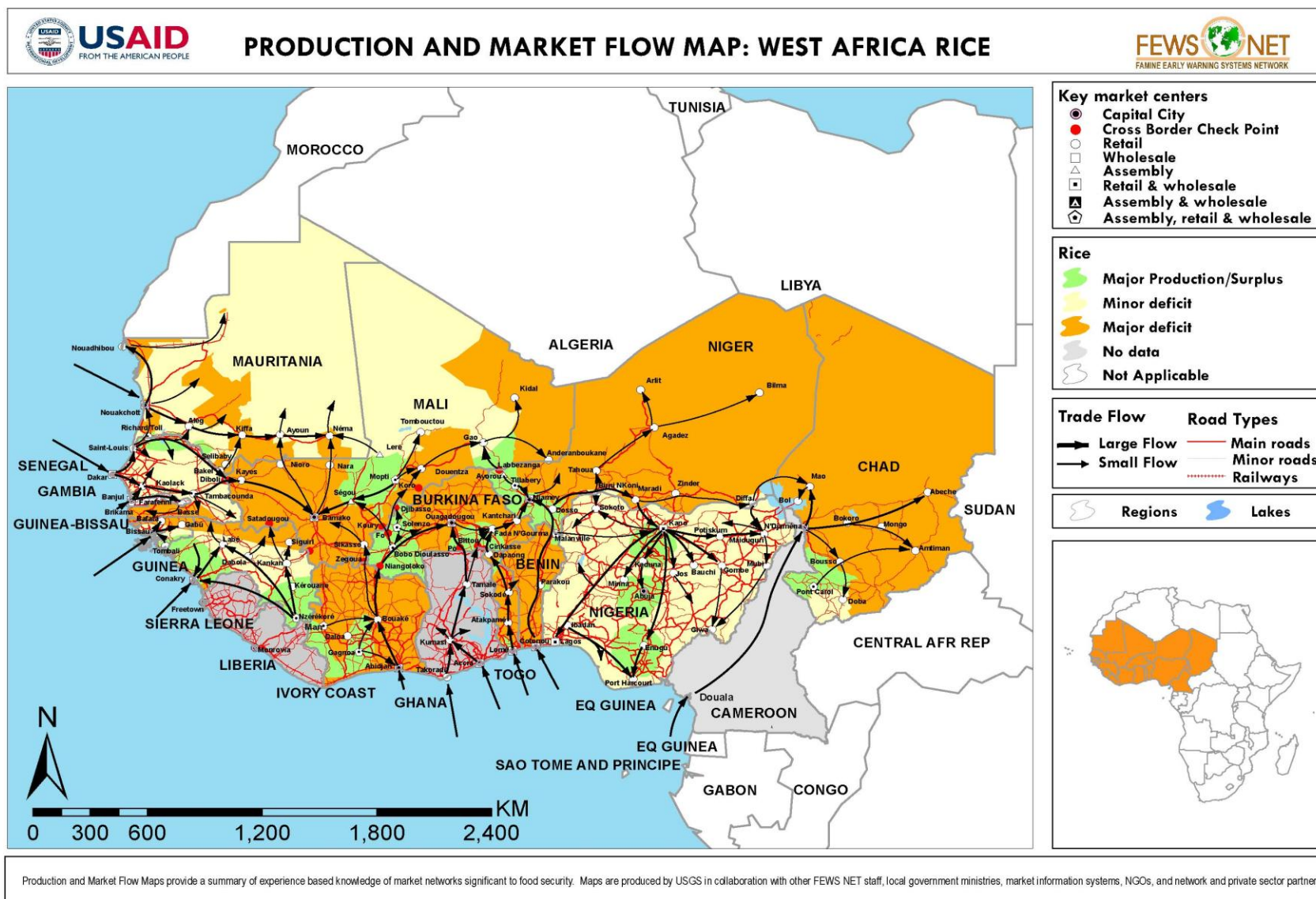
<sup>84</sup> International Trade Center (ITC) calculations based on UN COMTRADE data; accessed using ITC's TradeMap ([www.trademap.org](http://www.trademap.org)).

<sup>85</sup> See for example the FAO *Rice Market Monitor*.

<sup>86</sup> The Famine Early Warning System Network (FEWS NET) has created production and market flow maps for rice in Burkina Faso, Chad, Mauritania, Niger and Nigeria. These show areas of surplus and deficit within these countries. See <http://www.fews.net/pages/markettrade.aspx?loc=3&l=en>



Figure 10. Rice Trade Flows in West Africa



## 6. BARRIERS TO INTRA-REGIONAL TRADE

From an international trade perspective, rice continues to be one of the most protected commodities in both developing and developed countries, through high tariff and non-tariff barriers, export restrictions and aid, state trading and other domestic market interventions. Most Western nations heavily subsidize their rice producers, and in doing so depress world rice prices. Asian producers and major exporters such as Vietnam, Pakistan and India have national rice strategies for supporting production and sustaining market prices, although they generally do not heavily subsidize rice exports. Over the last five years, Thai prices have been set at above-market levels resulting in a build-up of government stocks that are disposed of via subsidies. This has played a key role in sustaining exports since without these subsidies, buyers, by and large, would have purchased rice from Thai competitors.<sup>87</sup>

For decades, governments in West Africa (including those in countries that produce most of the rice they consume) have intervened in the rice trade to stem the tide of rice imports and protect local producers. Nigeria has been most active in this respect, banning rice imports until 1995 and then allowing imports to resume with an *ad valorem* tariff of between 50 and 100 percent,<sup>88</sup> although this was cut to 30 percent in 2009. Like many West African countries, Senegal monopolized imports of broken rice (the most popular quality) via a state trading company until 1996. After 2000, however, Senegal imposed a 12 percent import duty, which was low for the region. Although most West African countries have officially stopped intervening in rice production and marketing following the structural adjustment reforms of the 1980s and 1990s, through input subsidies, price setting and other means, governments continue to influence the sector.

Regional trade is a cornerstone of West African economic and food security strategies within CAADP,<sup>89</sup> NEPAD, the West Africa Economic and Monetary Union (WAEMU) and ECOWAS. WAEMU, a group of eight primarily Francophone countries,<sup>90</sup> has successfully implemented a common external tariff (CET) among its members. However, ECOWAS has struggled to adopt the WAEMU CET, despite a commitment made in 2001 to do so. Although tariffs on imported rice have fallen in most countries since the 1990s, and the CET on rice within WAEMU has stabilized at a rate below 10 percent, countries such as Nigeria, Ghana and Sierra Leone have favored more protectionist policies in the name of national self-sufficiency. This protectionist behavior is evident in the variability of tariffs across ECOWAS member states (figure 11).

Discussion of tariff levels within the region has pitted the interests of producers, who want protection from foreign competition, against those of consumers, who want cheaper rice. When world food prices spiked dramatically in mid-2008, governments across the region responded by reducing or eliminating tariffs on rice imports, but this was not enough to prevent large increases in domestic prices of imported rice.

Even within functioning regional integration strategies such as the WAEMU customs union and CET, there is anecdotal evidence that such initiatives are not producing the intended benefits. For example, despite its active role in WAEMU and the preferential trade agreements between Senegal and the seven additional WAEMU member countries, all of Senegal's rice imports come from outside the region and as much as one-third of its small exports flow informally to Mauritania, Mali and Guinea Bissau.<sup>91</sup> Similarly, as ECOWAS nations move to emulate the WAEMU

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<sup>87</sup> Correspondence with Tom Slayton, August 2009.

<sup>88</sup> Akande, "An Overview of the Nigerian Rice Economy."

<sup>89</sup> The second objective of the CAADP Market Access Pillar (one of four pillars) states that CAADP will support African nations' ability to "Create the required regulatory and policy framework that would facilitate the emergence of regional economic spaces that would spur the expansion of regional trade and cross-country investments."

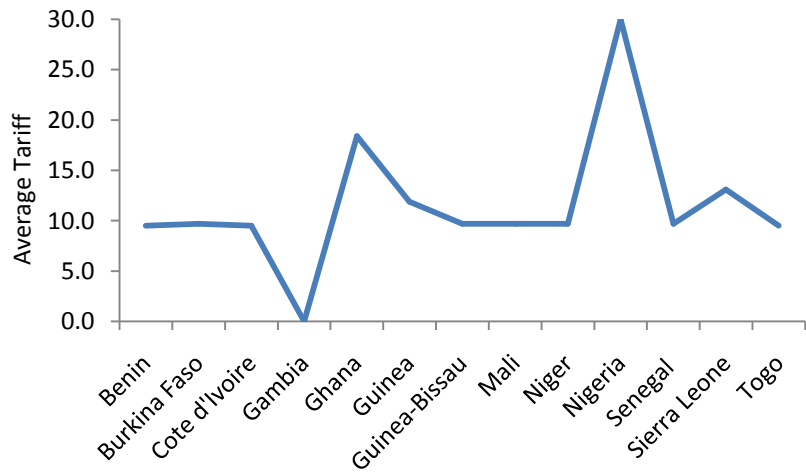
<sup>90</sup> Members comprise Benin, Burkina Faso, Côte d'Ivoire, Guinea Bissau, Mali, Niger, Senegal and Togo.

<sup>91</sup> See Attachment V, Senegal Value Chain Analysis.



customs union and implement free-trade agreements, there are reports that many local traders are still facing tariffs within ECOWAS borders and are often paying at least double taxation as goods move around the region.<sup>92</sup>

**Figure 11. Rice Tariffs in ECOWAS Member States, 2009**



Source: International Trade Center, TradeMap, [www.trademap.org](http://www.trademap.org)<sup>93</sup>

Within the NEPAD framework, three east-west superhighways are being examined for their trade potential. The Sahelian road would connect Dakar with N'Djamena, the Median road would connect Conakry with Abuja, and the Coastal road would connect Dakar with Port Harcourt.<sup>94</sup> These superhighways are indicated in figure 12. Obstacles to merchandise transport on these and other strategic corridors (see text box) are severe: A study of the West Africa Trade Hub's three focus corridors found that for every 100 km traveled on the Ouagadougou–Bamako road, transporters encountered at least three physical barriers, paid almost US \$10 in bribes and were delayed 20 minutes. This means the full trip was delayed three hours and cost the driver nearly US \$90 in bribes. Bribes and delays were also documented on the Tema–Ouagadougou and Lome–Ouagadougou roads.<sup>95</sup> ECOWAS undertook a similar study in 1999/2000 on a larger number of roads for its Regional Atlas of Transport and Telecommunication. It found that the distance between checkpoints ranged from every 14 km on the Lagos–Abidjan transport route to every 65 km on the Accra–Ouagadougou route.<sup>96</sup>

#### Strategic Transport Corridors

Proposed superhighways:  
 Dakar–N'Djamena  
 Conakry–Abuja  
 Dakar–Port Harcourt

West Africa Trade Hub corridors:  
 Tema–Ouagadougou  
 Lome–Ouagadougou  
 Ouagadougou–Bamako

West Africa GFSR-identified corridors:  
 Dakar–Bamako  
 Bamako–Abidjan  
 Monrovia–Abidjan

Other corridors proposed for development:  
 Lagos–Maradi  
 Ouagadougou–Maradi  
 Niamey–Cotonou  
 Abidjan–Lagos

<sup>92</sup> Akosile, “Common External Tariff – Region Adopts 5<sup>th</sup> Band.”

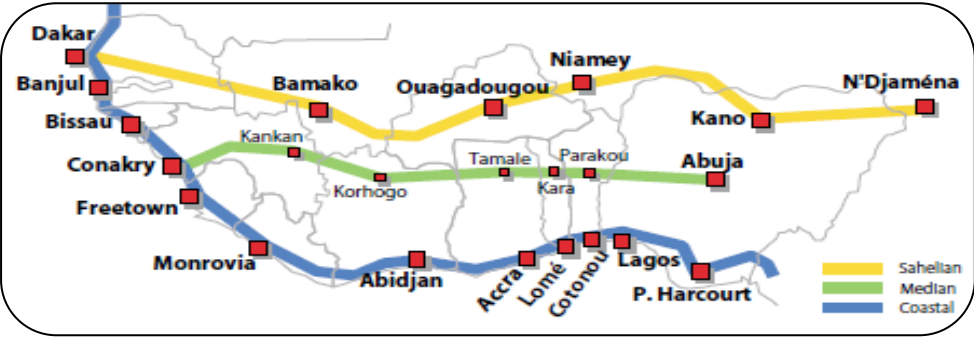
<sup>93</sup> Excluding Nigeria and Liberia where no data were available. Tariff is the weighted average of tariffs on paddy, broken, brown and milled rice.

<sup>94</sup> Regional Atlas of Transport and Telecommunications in the ECOWAS Zone, 2005.

<sup>95</sup> USAID, “Improved Road Transport Governance on Primary Corridors, Results of surveys taken Jan. 1 to March 31, 2009”

<sup>96</sup> Regional Atlas of Transport and Telecommunications in the ECOWAS Zone, 2005.

Figure 12. Three Future East-West Road Axes



Source: ECOWAS Regional Transport Atlas, 2005

While the poor quality of ports, roads, bridges and other infrastructure raises transportation costs, important research sponsored by the World Bank has shown that transport costs (cost to transport service providers) in Africa are not excessively high, contrary to general belief. What are extremely high are the *charges* levied (cost to shippers).<sup>97</sup> These excessive charges are primarily attributable to anti-competitive practices in the shipping market. Some of these distortions are government-created, such as the shipping bureaus that exist in the Francophone countries, while others are created by private business.

7. INFORMAL TRADE

There are no reliable statistics on the volume of informal trade in rice. Prior to the creation of the WAEMU customs union and establishment of the CET in 2000, there was little incentive to collect intra-regional statistics: a lack of transparency allowed traders to limit the taxes they had to pay and created opportunity for customs officials to supplement their income through informal payments.<sup>98</sup> Since the lifting of restrictions on trading local materials, quantities are no longer checked, with the result that information on informal trade volumes does not exist. Perhaps unsurprisingly, stakeholders interviewed during the country-level studies were reticent to talk about informal (illegal) rice trading, other than to acknowledge that it does happen.

<sup>97</sup> Raballand, Gael and Patricia Macchi. “Transport Prices and Costs.” This research covered more than 400 companies in 13 countries in sub-Saharan Africa. Burkina Faso, Ghana, Niger and Togo were among the countries included in the study, and its findings probably reflect the situation in West Africa generally.

<sup>98</sup> Terpend, “An Assessment of Knowledge about Trade and Markets Related to Food Security in West Africa.” 12.

# III. RICE MARKETS IN WEST AFRICA

## A. OVERVIEW

With an overall consumption of 13 million MT valued at over US\$10 billion retail (2009 estimate) and growing at 6.6 percent per year, West Africa is a large and fast growing market for rice. However, it is also a very fragmented market. Four general observations can be made.<sup>99</sup>

### 1. SEPARATION OF DOMESTIC RICE AND IMPORTED RICE MARKETS

Imported rice is mostly sold in urban markets, with local rice mainly consumed in rural markets, often close to the area of rice production. In Côte d'Ivoire, for example, it is estimated that only 10 percent of locally produced rice is consumed outside of rural areas. One large importer in Côte d'Ivoire estimated that not more than 25 percent of their rice goes to rural markets, where consumers can more readily shift to other crops if no rice is available or is expensive. There are notable exceptions: In Senegal, an estimated 30 percent of domestic rice is sold. In Nigeria, 40 percent of locally produced rice is estimated to flow to urban centers. In Mali and Guinea, both urban and rural consumers strongly prefer local rice for its freshness, and consequently imported rice (which can be old, depending on the time of year and origin of the rice) makes up less than 15 percent of national consumption.

### 2. URBAN MARKETS ARE KEY

Urban markets for rice are growing, driven by urbanization, population growth and rising incomes in the cities. Large urban markets are mainly found in Nigeria and along West Africa's coast where population density is the highest (figure 13). The biggest urban concentration in the region is Lagos (more than 13 million inhabitants). Other large markets include cities of more than three million people, such as Kano, Ibadan and Abidjan, and cities in excess of one million, including Accra, Dakar, Conakry, Kumasi, Kaduna, Port Harcourt, Benin City and Maiduguri. Inland urban areas, smaller but growing equally fast, are served by longer supply lines and run higher risks of food insecurity.

### 3. HIGH AND INCREASING SEGMENTATION IN URBAN MARKETS BETWEEN AND WITHIN COUNTRIES

**A single West African rice market does not exist; rather the market consists of individual country markets which differ greatly in terms of their size, importance of rice in food consumption, and consumer preferences.**

In terms of size, Nigeria is in a class of its own with a consumption level of approximately 5 million MT (2009 estimate). At the other end of the spectrum, countries such as Chad, The Gambia, Guinea Bissau, Mauritania and Togo are markets of less than 200,000 MT.

There is also great variation in terms of the importance of rice to the daily diet. In countries such as Burkina Faso, Cameroon, Guinea, Sierra Leone, Côte d'Ivoire and Senegal, rice is an essential staple and price increases have led to a strong consumer response, as evidenced by the mass demonstrations and riots during the price spikes in the spring of 2008. Consumers in these countries reduce their purchases of other food items (particularly meat and wheat products) before reducing their rice purchases.<sup>100</sup> Conversely, in a country such as Ghana, where rice is a less essential staple

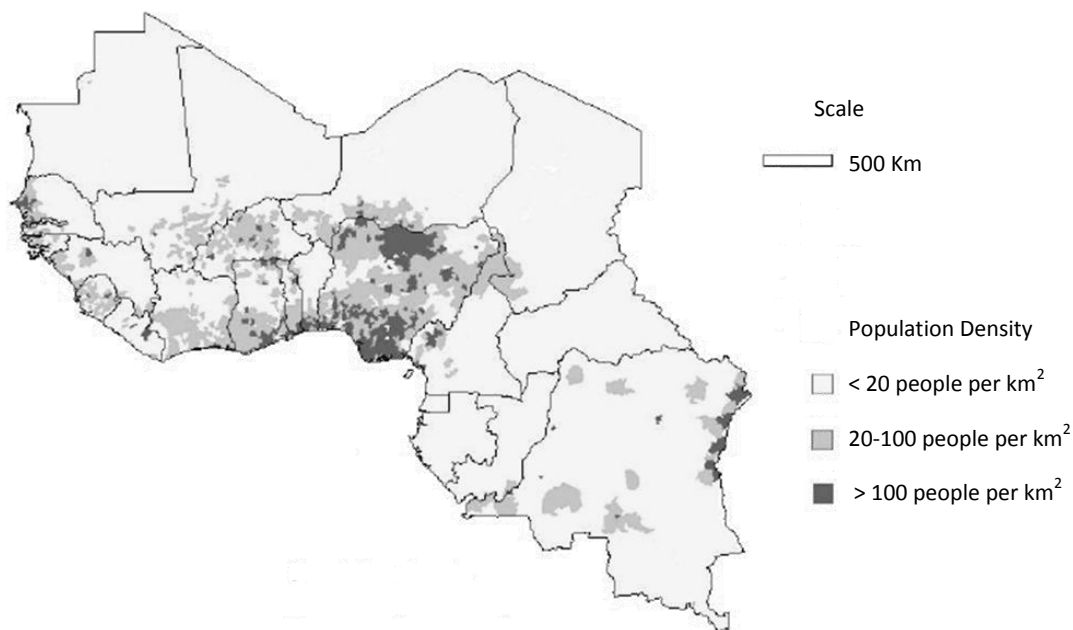
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<sup>99</sup> This section draws extensively on key informant interviews with importers, wholesalers, retailers, and consumers, as well as market visits in Côte d'Ivoire, Ghana, Benin and Senegal, during a field visit in July 2009.

<sup>100</sup> Lançon, "Rice imports in West Africa."

food item, households more readily switch to other crops such as plantain, corn or cassava when the price of rice increases. In such markets, consumers are also more likely to switch to wheat products (bread, pasta) as incomes rise, and are therefore not as affected by an increase in rice price.

**Figure 13. West Africa Population Density**



Consumer preferences vary greatly between and within countries. Although typically one rice product dominates in a given market, especially in more affluent markets such as the urban markets of Ghana and Côte d'Ivoire, there is often a wide range of rice products available. For example, in Ghana, 5 percent broken non-aromatic Thai may be the dominant rice product, but aromatic jasmine Thai rice emerged five years ago and now represents 20 percent of rice imports. A rice wholesaler in Accra may carry more than 15 different types of rice products including US long grain rice, local brown rice and small branded packages.

The increasing complexity and heterogeneity of the West African rice market is reflected in the procurement practices of large international rice importers, such as Louis Dreyfus, Olam, CIC and others. These importers do not have regional import strategies or systems, but rather operate through individual country offices that understand and cater to the specific needs and wants of consumers in those countries.<sup>101</sup>

#### 4. PERCEIVED GAP IN QUALITY BETWEEN IMPORTED AND LOCAL RICE

No matter what the importance of rice in the diet or the income category, consumers set minimum quality standards and are unlikely to buy lower quality, cheaper rice that does not meet their standards.<sup>102</sup> For example, it is very difficult to sell a lower quality grade such as 25 percent or higher broken rice in urban markets in Ghana. When world prices are low, consumers often switch to a higher quality of rice. A normal buyer of 25 percent broken, for example, might switch to 15 percent broken.

<sup>101</sup> Albeit that individual orders from the different countries are aggregated at the commodity traders' global headquarters to achieve economies of scale in procurement and transportation.

<sup>102</sup> Consumers may buy lower quality rice if they have time available. A recent study in Senegal using experimental auctions showed that some consumers prefer the cheaper mixed grain quality because it allows them to separate it themselves, sort it and obtain three different grain sizes: whole, medium and broken. Rutsaert Pieter, Matty Demont, Maimouna Ndour, and Eric Tollens. "Competitive Rivals."

The perceived inferior quality of local rice is mainly due to a large percentage of foreign matter and low levels of grading and sorting.<sup>103</sup> As stated above, important exceptions to this generalization are Mali and Guinea where consumers prefer local rice in terms of freshness and taste. Local rice also plays an important role in certain urban markets in Senegal (Saint Louis area) and in Nigeria (Kano area).

## B. CONSUMER PREFERENCES AND MARKET SEGMENTS FOR RICE

The West African rice market is primarily segmented on the basis of quality attributes that match different consumers' preferences, which are complex and vary by locality (see table 11 in annex I). Dominant preferences vary by country, between rural and urban areas, and often between various regions within a country. Even within a given urban household, consumers prefer different types of rice depending on the specific meal they are preparing that day.

Within this complexity of rice products, the Africa Rice Center identified the following generalized main West African consumer preferences:<sup>104</sup>

- **Long-grain white rice with an intermediate level of starch** dominates the markets in most of West Africa, except for those markets that prefer parboiled or broken rice (see below). Consumer preferences for percentage of grains broken differ from country to country. In Ghana, for example, most consumers demand 0-5 percent broken rice although limited amounts of 25 percent broken rice are imported from India and Pakistan, and there is a large market for aromatic 100 percent broken. In other markets, like Côte d'Ivoire, Mali and Burkina Faso, the predominant consumer preference is for 25 percent broken rice.
- **Broken rice** sells as a low quality, low cost product in most markets, but is the preferred rice product in Senegal and Mauritania. Within this rice category of 100 percent broken long-grain white rice, quality is in part determined by the uniformity of the broken rice pieces. According to Slayton,<sup>105</sup> about 500,000 MT of Thai Jasmine broken are typically imported into West Africa, with three-quarters of this amount imported by Senegal and about 15 percent by Mauritania.<sup>106</sup> ITC calculations based on UN COMTRADE data put overall imports of broken rice at approximately three times this amount, with Senegal importing approximately half.<sup>107</sup>
- **Parboiled rice** falls into two categories: high quality (with a golden tinge) and low quality (with a dark color and sometimes an odor). Nigeria is one of the largest importers of fully-milled, high quality parboiled rice and Liberia is one of West Africa's top importers of low quality parboiled rice.<sup>108</sup>
- **Aromatic (mostly jasmine) rice** is an emerging and growing rice market segment that commands premium prices (US \$300-400/MT above non-aromatic rice) and is increasing in popularity throughout urban West Africa. Imported aromatic rice comes mainly from Thailand (the benchmark) and Vietnam and usually has a low percentage of broken. Ghana was one of the first countries to adopt aromatic rice, but it is growing in popularity throughout the region with increases in urbanization (comprising approximately 20 percent of imports in Ghana and Côte d'Ivoire). Aromatic rice is often mixed with other rice, especially by restaurants. Local production of aromatic rice in the region is low.

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<sup>103</sup> Somado, *NERICA: The New Rice for Africa – A Compendium*, 3

<sup>104</sup> Traore, "Characterization of Novel Rice Germplasm from West Africa and Genetic Market Associations with Cooking Quality"

<sup>105</sup> Slayton, "A Primer on the World Rice Market in the 21<sup>st</sup> Century."

<sup>106</sup> Ibid

<sup>107</sup> Accessed using ITC's TradeMap ([www.trademap.org](http://www.trademap.org))

<sup>108</sup> Lançon, "Rice imports in West Africa," 13-14

- **Round-grain (*Japonica*) rice** is used for making porridge because the grains cling together when cooked. This is the preferred rice in Liberia.

Various other types of rice are sold in smaller volumes to niche market segments. These range from relatively cheap brown rice processed by farmers or small traders using artisanal milling equipment, to basmati rice, an aromatic imported from India and Pakistan.

## C. TRADE STRUCTURE—RETAILERS AND WHOLESALERS

The separation of domestic and imported rice in most countries in West Africa translates into different marketing channels. Local rice is mainly distributed by retailers in rural areas and smaller towns.<sup>109</sup> These retailers typically buy in small quantities, directly from farmers or small traders. Quantities traded are small, not only because they originate from small farms that produce limited quantities, but also because farmers keep some of the rice for food and some for price speculation and to smooth their income over time. In some countries, such as Mali and Nigeria, larger volumes of local rice reach major urban markets—in the case of Mali, through travelling collectors, semi-wholesalers and sorting retailers, and in the case of Nigeria through contract farming or outgrower schemes linked via milling operations of various sizes to the same wholesale and retail networks used for imported rice.

By contrast, imported rice is distributed through cascading networks of wholesalers and retailers that originate in the major urban centers. For example, a large importer may have 150-400 wholesaler-buyers, some of whom handle US \$1 million per month in rice. In terms of volume, larger wholesalers in Ghana or Côte d'Ivoire may sell 5-20 MT per day, buying from 5-10 different importers. Some wholesale traders sell a range of rice products and others specialize in just one rice product. Each of these wholesalers may in turn sell to 15 or more semi-wholesalers, who retail the rice and sell it wholesale to many more small retailers. Supermarkets currently play only a minor role in rice retailing (e.g., 10-15 percent of the market in Ghana). Supermarkets sell mostly high-end rice products to relatively wealthy households, although some also sell rice in 50 kg bags.

Importers provide credit to their larger wholesalers, which is a critical element of wholesalers' management of working capital. To a lesser degree wholesalers provide credit to the retailers that buy from them. For domestic rice, all transactions are paid for on cash-on-delivery terms, with no agent capable of providing credit. One notable exception to this is the Senegal River Valley, where the *Caisse Nationale de Crédit Agricole du Sénégal* facilitates a structured trade financing scheme for rice farmer associations.

Margins at the wholesale level are the result of what could be described as competitive collusion: wholesalers agree to a standard mark-up that is small and driven by a high turnover strategy and a desire for easy accounting. For example, wholesalers in Ghana will use a markup of 1 Ghana cedi per item sold, no matter what the volume. All wholesalers are trading the same products right next to each other, so any price difference would be picked up by retailers right away. Local rice sold in urban markets is often priced relative to the price of imported rice. For example, in Senegal rice prices leaving the mill, agreed upon by stakeholders in an annual or seasonal workshop, are basically set CFA 10-20 below the prevailing free-alongside ship (F.A.S.) prices for a comparable imported rice.

The institutional market environment is generally weak. There is no formal market information system for traders in rice. Traders generally rely on cell phone communications within their network. These communications can start from the Geneva headquarters of a large rice trading firm, enquiring with their country-level agents about interest in globally available rice lots. From there it filters down to small traders. Although the urban rice distribution system generally meets the preferences of the markets it serves, there is a dearth of information to enable traders to find markets for

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<sup>109</sup> Ibid



surplus production. There is no regionally networked trading platform with standards, certified storage capacity or a warehouse receipt system. There are no commodity exchanges, although their development is featured prominently in CAADP and a West Africa Commodity Exchange based in Ghana with regional offices has been under development for some time.<sup>110</sup> Such institutions would open up the rice business to buyers and speculators beyond the current closed group of insiders.

As indicated in section II, trading networks for rice are regional: Rice shipments are formally imported in one country only to be exported informally to another. This may be done to avoid high import tariffs in one country, or for other reasons such as geographic proximity (lower transportation costs), port capacity limitations (e.g., it costs US \$10,000/day for boats waiting for a docking site in the congested port of Lagos) or trust issues (e.g., international traders are willing to provide credit to buyers in Benin but not to buyers in Nigeria). Importers sell to local wholesalers at local market prices and these traders then take the rice either directly across the border or sell it in key markets located near the border.

## **D. COMPETITIVE POSITION OF WEST AFRICAN RICE**

The competitiveness of West African rice relative to imported rice can be discussed along four sets of key success factors. These factors vary by consumer segment and market location. For example, a rice producer can be competitive in a nearby rural market while being uncompetitive in major cities. Therefore any competitiveness strategy has to start from the specific market segment and location targeted.

### **I. QUALITY**

As indicated above, local rice in many cases is perceived to be of a lower quality than the comparable imported product which sets the benchmark (Mali and the Senegal River Valley are notable exceptions).<sup>111</sup> Quality is here broadly defined as a set of general characteristics preferred by the consumer, such as aroma, swelling capacity, cooking time and so on. Two key quality issues with local rice—largely a result of using artisanal processing in small volumes—are its high level of impurities and its lack of uniformity (i.e., it is not graded). There are markets for (100 percent) broken rice and long grain rice (with a low percent of broken), but only consumers with a sufficiently low opportunity cost for their time buy a mixed product (such as 50 percent broken) because this requires them to sort the rice into two products, as cooking methods differ for each.

A lack of product uniformity means that cooking times and results vary. For example in Senegal, due to a lack of standardization of local rice varieties, key informants stated that they purchase imported rice despite its higher price because of its reliable cooking performance. Some characteristics add to or subtract from the quality of a product, depending on the market segment that is targeted. For example, cheap imported 25 percent broken rice from Burma is older than local rice (depending on the season), and because older rice swells more than fresh local rice when cooked, it is often preferred by poorer households because the whole family can be fed for less money.

Conversely, local rice does hold a competitive advantage in terms of quality over imported rice in some cases. Being largely linked to seasonal sales (as opposed to sales of old stock), freshly milled local rice is fresher than imported rice, and this is a characteristic that weighs heavily in the purchasing behavior of consumers in countries such as Mali and Guinea. In some countries there are local rice varieties with unique taste characteristics that are particularly liked by consumers. For example, *ofada* rice in Nigeria is liked by consumers of all income classes for its distinct taste and aroma. In addition, one consumer study in Nigeria revealed that consumers believed that imported rice has gone through

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<sup>110</sup> CAADP “Framework for Improving Rural Infrastructure and Trade Related Capacities for Market Access”; Bowers, “Ghana plans Commodity Exchange to steady food prices.”

<sup>111</sup> See for example Lançon, “Rice Processing in Nigeria: A Survey” for the large Nigerian rice market.

some chemical processes that reduced its “naturalness” and by contrast domestic rice is perceived as being more nutritious.<sup>112</sup> These qualities have resulted in sales at a premium for local rice. For example, fresh quality rice in a market in Abidjan sold for CFA 400/kg, while an average quality imported rice sold for CFA 350/kg. Moreover, consumers in Senegal were willing to pay as much as an 80 percent premium over imported rice for a branded, high quality, local rice.<sup>113</sup>

It is the overall set of characteristics that determine the quality and hence consumer acceptance of a rice product. For example, although consumers like the aroma and taste of *ofada* rice in Nigeria they do not consume much of it outside of restaurants because when bought in the market it has a “dirty” appearance, many impurities, discolorations and a high starch content.<sup>114</sup> Cooking requires four or five time-consuming stages.

## 2. PRICE

Local rice has to overcome a quality image problem in most West African markets, and in such cases, a price discount may be needed to entice consumers. The five country studies conducted in the context of this value chain analysis, indicated that local rice is or can be price competitive with imported rice. Margins appear to be sufficiently high to maintain price competitiveness even after taking into account the costs of necessary quality improvements. For example, one key informant in Senegal indicated that the prices of rice at the mill could drop from the current CFA 240/kg to CFA 200/kg and local rice production would still be profitable. Achieving price-competitiveness is dependent on each link in the value chain and requires high yields, large volumes, low input costs and high levels of efficiency throughout. West Africa has some competitive and comparative advantages in this regard. These include the avoided cost of global transport (likely to increase) and the potential yield in some areas of West Africa (the Sahel zone in Senegal and Mali can achieve some of the highest yields in the world under irrigation). Price competitiveness is also determined by the wide range of factors that determine the price of imported rice: For example, there are indications that large supplies (from stock reduction and new production) from some Asian countries will reduce world market prices in 2009.<sup>115</sup>

## 3. DELIVERY

The absence of trade credit and aggregation in local rice value chains make it difficult for the existing urban market distribution system to tap into domestic production. As a result, local rice is largely absent from urban markets and thus not an option for consumers, even if they want to buy it. Wholesalers in Ghana for example believe that there is a market for local rice, but they prefer selling imported rice as they receive credit from importers and sources of financing for working capital are not available to wholesalers of local rice.<sup>116</sup>

One key advantage of imported rice is that it is easy to order based on reliable supply chains that source from large stocks held in the country of origin as well as from the markets. Local rice is generally not aggregated and warehoused. There are almost no sales points where wholesalers can place an order. Due to the small volumes traded and the seasonal nature of supplies in the absence of sufficient storage, local rice is usually out of stock in urban markets. Importers on the other hand typically maintain a one- to three-month stock of rice. This reflects not only the relatively long order-cycle (one month or more) but also the need to deal with demand fluctuations. During periods such as Ramadan or Christian holidays demand can increase by 35 percent.

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<sup>112</sup> National Cereals Research Institute, “Report on Financial Analysis of Rice Parboiling/Processing Systems in Bida Area, Niger State, Nigeria.”

<sup>113</sup> Rutsaert, “Competitive Rivals.”

<sup>114</sup> Ibid

<sup>115</sup> Berry, “Last Year’s Rice Boom Turns to Slump.”

<sup>116</sup> Lançon, “Rice imports in West Africa: trade regimes and food policy formulation,” 13-14



## 4. PROMOTION

There is currently little promotion of rice products in general, but promotion will be a key success factor for domestic rice. Promotion needs to communicate that the perceived weaknesses of domestic rice no longer apply, at least for particular products. This means promoting the product quality, price, availability and cooking instructions. The latter is important since, unlike most imported rice, local rice (e.g., in Senegal) often needs to be soaked in water before being cooked. To generate consumer confidence in the products, quality enhancement must precede promotion efforts.

The promotional tool of branding is used almost exclusively for imported rice, although in some places branding of local rice is emerging. Some importers in Ghana and Côte d'Ivoire have started to sell local rice in branded bags, but with little improvement in quality; this has had little success in the market. More promising is the local rice sold under the “Rival” brand name in Senegal. This rice has gone through a systematic improvement of quality (especially in terms of double water polishing and sorting) and has received rave reviews from consumers.<sup>117</sup> Sales in this case are, however, constrained by supply limitations.

## E. POLICY IMPACTS ON RICE MARKETS IN WEST AFRICA

Policy has a strong impact on rice markets. Some of the key issues include the following:

### 1. RICE IMPORT POLICIES

These relate to import duties, import bans, trade liberalization and government purchases and sales of imported rice held in food security stocks. Import duties and other taxes differ by country, thus influencing the importance of the different ports of entry and informal trade. For example, the normal import duty on rice in Côte d'Ivoire is 10 percent, while it is 20 percent in Ghana, thus favoring imports to the former combined with informal trade between the two countries. Even with both countries temporarily eliminating import tariffs to address high rice prices, it is more expensive to import into Ghana, which unlike Côte d'Ivoire charges a 12.5 percent value-added tax. These import policies for rice influence the competitive position of imported rice *vis-à-vis* local rice. Interestingly, import levels are not always negatively correlated with local production levels, as other factors come into play as well (e.g., rapidly growing demand, shifts in consumer preferences, or changes in the efficiency of local rice production, milling or distribution).<sup>118</sup>

### 2. COMMERCIALIZATION COMPONENTS OF LOCAL RICE SUPPORT PROGRAMS

These programs have emerged largely in response to the recent rice price crisis. For example, both Senegal and Côte d'Ivoire have commercialization components in their support programs. These programs aim to address the key drivers of competitiveness for rice: quality, aggregation, internal trade facilitation and promotion. Even without a commercialization component, such programs can affect the competitive position of domestic rice in the market through their impact on quantity and price increases derived from upgrading at the production level.

### 3. CURRENCY FLUCTUATIONS

Currency fluctuations, which to a large degree are influenced by monetary policy, can have a strong effect on the competitiveness of local rice. For example, the recent 50 percent depreciation of the local currency in Ghana increased the local currency price of imported rice (producing a positive effect on competitiveness) as well as increasing the price of imported inputs (producing a negative effect on competitiveness).

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<sup>117</sup> Rutsaert, “Competitive Rivals.”

<sup>118</sup> Lançon, “Rice imports in West Africa.”

# IV. RICE VALUE CHAINS IN WEST AFRICA

## A. VALUE CHAIN STRUCTURE AND DYNAMICS

### I. INPUT SUPPLIERS

In many countries in West Africa, there are only a few formal input suppliers—large, national or regional, private-sector firms which cater primarily to government and donor clients and large-scale producers. Most inputs (fertilizers and pesticides) are imported into the region by wholesale input distributors and then supplied to small-scale retailers for onward sale to smallholder farmers and a few commercial producers. Informal traders also sometimes engage in input supply. Technical assistance is rarely provided with the sale of inputs. In many countries, inputs (particularly fertilizers) are provided free or at a subsidized rate by the government or by donor-funded programs, leading to market distortions and a lack of incentive for private-sector investment. Outside of formal irrigation schemes, where organized farmer groups often purchase inputs in bulk, smallholder farmers generally do not use fertilizers due to high cost and limited availability.<sup>119</sup>

The seed industry throughout most of the region is largely controlled by the government or parastatal institutions. In some countries, licensed private-sector firms (e.g., in Ghana) or smallholder cooperatives (e.g., in the Office du Niger in Mali) produce certified seed; in other countries (such as Liberia), private-sector involvement is minimal. Even in Nigeria the largest private-sector seed activity is the production and sale by multinational company Olam of about 700 MT per year to its contract growers. Thus, while excellent seed varieties exist—including NERICA, a family of new varieties being promoted by the Africa Rice Center and JICA that crosses high-yielding Asian strains with stress-resistant African strains; and other elite varieties developed by the IRRI and National Agricultural Research Systems—their distribution and adoption is weak. For example, a study in Côte d'Ivoire<sup>120</sup> found that only 4 percent of farmers had adopted NERICA while 27 percent could benefit from it.

Given the labor-intensive nature of rice production and competing demands on women's time from family duties (exacerbated in some parts of the region by the out-migration of men to cities as well as declining male populations due to conflict), there is a particular need to promote the adoption of appropriate seed varieties among women rice farmers. NERICA varieties can be harvested earlier, thus allowing for a second crop of beans or vegetables to provide additional income and nutritional value. In a number of rural communities in Guinea, rice farmers are planting *niébé*, a variety of bean that grows within two months and restores nutrients to fields cultivated with NERICA. In other places, rice is followed by sweet potato on residual moisture. The new rice varieties also reduce the need for weeding by choking off weeds, significantly reducing the labor required, since weeding can take up 40-60 percent of women's labor in rice production.<sup>121, 122</sup>

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<sup>119</sup> For example, 65 percent of rice farmers interviewed in Cameroon have never used chemical products. See "Food Sovereignty in Cameroon: a study based on the rice sector." ACDIC. Some reports in Nigeria cite politicians using subsidized fertilizer to gain political patronage. PrOp-Com Program Report 2007.

<sup>120</sup> Diagne, "Diffusion and Adoption of NERICA Rice Varieties in Cote d'Ivoire."

<sup>121</sup> Food and Agriculture Organization of the United Nations. "Gender and Rice."

<sup>122</sup> Harsch, "Farmers embrace African 'miracle' rice," 10.

The slow pace of adoption of improved seed can be explained by a number of factors, including the tendency of small-scale farmers to use retained, unimproved paddy for seed in the subsequent year; the distortionary effects of government involvement in the enabling environment; and the consequent lack of input supplier retail networks to reach rural producers. The global rice seed market is also under-developed and many exporting countries restrict exports of certified seed. The overall impact of weak input industries is a lack of investment by farmers at the beginning of the production process. This generally leads to lower yields and a lower-quality finished product, and lower-quality domestic rice loses market share to higher-quality imported rice.

## 2. PRODUCERS

There are three broad categories of rice producers in West Africa: i) small-scale farmers that produce rice as a subsistence crop using a low-risk, low-input, low-yield strategy; ii) small-scale farmers that are increasingly producing rice as a cash crop, possibly as part of an irrigation scheme or as contract growers or outgrowers to a larger firm; and iii) larger-scale commercial farmers.

The vast majority of rice growers in West Africa are subsistence farmers producing rain-fed rice for consumption and selling surpluses through friends and family networks or in local markets. Among such farmers, traditional forms of cooperation often exist, primarily to manage labor shortages that are tied to traditional slash-and-burn extensive agriculture practices, but commercial linkages are minimal. Rice is not considered to be a crop worth investing in, and in some areas, subsistence farmers have an expectation of ongoing government or donor assistance. Within subsistence farming communities there may be a minority of entrepreneurial farmers who are more willing to take risks with dedicating a percentage of their land to commercial crop production and are more open to experimentation with inputs and new production practices.

Small-scale farmers generally employ a low level of mechanization for soil preparation, milling, reaping and threshing because of land fragmentation and limited resources. They either harvest and process rice manually, or pay for harvesting, threshing and rice milling. Manual threshing by smallholders leads to poor grain quality. However, a mechanized thresher cleaner (developed by the Africa Rice Center, IRRI, a local NGO<sup>123</sup> and local private companies in Senegal) is widely used in the Senegal River Valley and is being adopted in other parts of the region as well.<sup>124</sup>

Paddy is dried immediately after threshing, and the timing is important since delays in drying cause the rice to darken. Sun drying is the usual method of drying the harvested rice crop, as it is free, although it generally leads to a low quality product due to uneven or excessive drying, high levels of broken grains and contamination with sand and small stones.<sup>125</sup> This is a significant problem because in many countries in the region, the absence of foreign matter (principally stones) is the most important component of quality. During the wet season, if there is no artificial drying capacity, rice may sprout and rot before it can be dried. When drying machines are introduced, poor technical performance or improper use of the technology can lead to fissured grain. According to a 2003 survey in Nigeria, “The investment in new equipment like de-stoners is necessary but it would have a real impact only if the quality issue is tackled holistically at the various stage of the commodity chain to establish an enabling marketing environment through the emergence of a shared concern among stakeholders.”<sup>126</sup> De-stoners would be less necessary if alternative methods of drying were used.

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<sup>123</sup> *Société Nationale d'Aménagement et d'Exploitation des Terres du Delta du Fleuve Sénégal et des Vallées du Fleuve Sénégal et de la Falémé* (Society for the Development and Exploitation of the Senegal River Delta and the Valleys of the Senegal and Falémé Rivers)

<sup>124</sup> Somado, “Module 12: Harvest and Post-Harvest Operations.”

<sup>125</sup> Berhe, “Promoting rice *from plant to plate* for food security in sub-Saharan Africa: SG2000's strategy.”

<sup>126</sup> Lançon, “Rice Processing in Niger: A Survey.”

Simple technologies for on-farm storage of paddy exist.<sup>127</sup> However, for rice that is to be sold, it appears to be preferable to not store paddy on the farm, but rather to move it expeditiously to the mill for volume storage.<sup>128</sup>

In many countries in West Africa, the majority of rice farming is done by women. Women in West Africa often do most of the work related to rice planting, weeding, harvesting and processing, while men are more involved in clearing the land and in the production of cash crops. This is particularly true for countries where rice is a major part of the diet. In Nigeria, where rice is a cash crop and only a minor part of the diet, rice production is mostly done by men and post-harvest activities are the domain of women.<sup>129</sup> In Mali, the gender division of roles in rice production varies by production system. In most productive systems, revenue from rice is generally controlled by the head of the household who is responsible for marketing decisions, usually a male. An exception to this is in the Southern rain-fed zone around Sikasso where lowland rice is mainly cultivated and marketed by women.<sup>130</sup> Since rice in this zone is a relatively small part of most family's cropping mix, it is not clear that, with an expansion of areas planted, rice would necessarily remain under the control of women. In addition, in the Office du Niger zone, where most families hire outside labor to complete the more labor-intensive steps in rice production, many of these tasks are habitually completed by women. These include transplanting of seedlings and assembly and stacking of harvested rice stalks in the field for drying.

In contrast to smallholder farmers, emerging commercial farms may cultivate more land under formal tenure arrangements, use mechanized soil preparation, possess harvesting or hulling equipment, and/or sell milled rice rather than paddy, possibly marketing directly to retailers or consumers. Commercial farmers may also purchase paddy from other farmers to "top up" their processing capacity. Larger-scale commercial producers are typically vertically integrated firms, with significant milling capacity, ready access to inputs and networks of paddy suppliers (traders, buying agents, outgrowers or contract farmers).

The prevalence, form, functions and capacity of farmer organizations varies enormously across the region. In countries such as Liberia, cooperatives are a carryover from former socialist-oriented government administrations; many are ineffective or exist principally to access the subsidized goods and services of government- or donor-funded programs. At the opposite end of the spectrum, in Mali, second level apex organizations provide primary organizations with a range of formal services, including collective marketing services and the facilitation of credit for production and storage through a guarantee program with the a national bank. Typically, members of farmer organizations in West Africa collaborate to access agricultural inputs and possibly credit through their farmer organizations but sell most of their rice as individuals. In many cases, their sustainability in the absence of subsidies is questionable.

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<sup>127</sup> See, for example, FAO. "Rice is Life." A design for a simple metal silo is also available at [www.postcosecha.net](http://www.postcosecha.net).

<sup>128</sup> Correspondence with Tom Remington, CRS, August 2009.

<sup>129</sup> Erenstein, "Rice production systems in Nigeria: A Survey."

<sup>130</sup> One possible indication of the degree of importance of women's participation in the various systems can be found in the sample survey that was used to evaluate the 2008/09 Initiative Riz. With a survey instrument directed at the household member responsible for rice cultivation, the survey included women in its sample at the following rates: 6 percent for large-scale gravity systems; 6 percent for flood-based systems (controlled and non-controlled); 26 percent for upland rain-fed rice; and 47 percent for lowland rain-fed rice. See Ministère de l'Agriculture, Bilan de l'Initiative Riz: champagne 2008-2009.

The location and ecology of a production area can present some specific production challenges, including:

- **Upland rice cultivation**—drought; reduction in soil organic carbon and nitrogen supplying capacity;<sup>131</sup> grass and broadleaf weeds (particularly for direct seeded rice); diseases such as brown spot disease,<sup>132</sup> leaf blast, leaf scold and false smut; pests including birds and rats; and competition with other crops.
- **Rain-fed lowlands**—drought and flood; iron toxicity; birds and rats; weeds; insect pests such as rice gall midge, case worm and stalk-eyed flies; and diseases such as rice yellow mottle virus and blast.<sup>133</sup>
- **Irrigated rice cultivation**—poor land preparation, leveling and irrigation management; inadequate drainage leading to salinity and alkalinity; poor management of inputs, weeds, pests, diseases; losses due to birds; and deteriorating infrastructure, especially with large public schemes.<sup>134</sup>

There are a number of proven practices that producers could apply, given sufficient access to appropriate resources including extension advice and commercial networks—if the incentives are in place to promote their adoption. Many of these proven practices are components of the System of Rice Intensification (SRI), including transplanting rice seedlings from a nursery instead of direct seeding, which reduces yield loss due to weed competition. Intensified tillage is also promoted under SRI, using appropriate technologies such as rotary weeders and animal traction. The adaptation of animal traction for rice tillage is an innovation that integrates the use of rice byproducts as animal feed with the use of manure for integrated soil fertility management. However SRI is not a comprehensive solution to the challenges of rice farmers in West Africa, mainly because it is labor-intensive, which makes it expensive. Water control and manure availability constraints are also significant in some areas, preventing widespread farmer adoption.

The impact of technological changes on the division of labor in the household must be considered to ensure that interventions benefit women and the household. For example, in The Gambia, the introduction of pump-irrigated rice enabled year-round production and produced increased revenues. These changes resulted in women's loss of access to the land, a shift in control of the rice crop from women to men and increased intra-household conflict.<sup>135</sup> Interestingly, irrigated rice production schemes in Liberia have not fared the same as those in The Gambia. Liberian irrigation schemes have had only limited success and women have retained control of the rice crop. A contributing factor may be that pump-irrigated rice requires men's labor, and men lack incentives to labor on a traditional women's food crop. Further, lowland rice growing areas are considered to be of a lower quality and more difficult and hazardous to farm than upland areas, and so there has been limited competition within households for control of irrigated rice plots.

### 3. TRADERS

Paddy traders play a critical role in the rice value chain, aggregating product and controlling for quality. Generally, traders do not have formal contracts with farmers, but may provide them with seed or short-term finance to secure paddy at harvest. Local or smaller traders may have fewer problems with side-selling than larger buyers due to their proximity to farmers and personal knowledge of them. Some traders produce paddy of their own in addition to purchasing from neighboring farms; other traders are also processors. Traders may be independent or linked to higher level buyers who can furnish them with cash advances. They may also sell rice directly to retailers or even act as retailers themselves in smaller urban markets.

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<sup>131</sup> Becker, "Cropping Intensity Effects on Upland Rice Yield and Sustainability in West Africa."

<sup>132</sup> In Nigeria, yield reductions of 12-43 percent have been attributed to brown spot disease. See Aluko, "Crop Losses Caused by the Brown Leaf Spot Disease of Rice in Nigeria."

<sup>133</sup> Ikeda, Japan International Research Center for Agricultural Sciences NewsLetter. No.38

<sup>134</sup> Defoer, "Challenges, innovation and change: towards rice-based food security in sub-Saharan Africa."

<sup>135</sup> Carney, "Women's land rights in The Gambian irrigated rice schemes," 325-336.

Generally, traders move locally produced paddy from principal production areas to mills and then on to the main markets, though volume flows are often low due to limited working capital. In isolated areas without much milling capacity, many traders simply buy paddy in their local market when the prices are lowest and store it locally until the prices increase. At this point, they sell to other traders (often millers) who travel long distances to bring the paddy to the mill. Traders are less important to non-commercially oriented farmers, who keep most of their production and prioritize sales to community members (bartered or based on market prices).

Aggregators throughout the chain are constrained by an underdeveloped warehousing capability, poor roads and expensive transport, and a lack of trust that makes producers want to process and sell rice on an individual basis, leading to a lack of economies of scale.

#### 4. PROCESSORS

The types and levels of processing vary enormously among and within West African countries. Figure 14 shows the general stages of rice processing. Figure 15 shows intermediate steps that may be included or omitted, depending on local processing capacity and market demand.

Figure 14. Post-Harvest Rice Processing

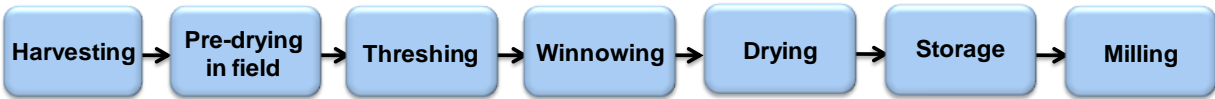
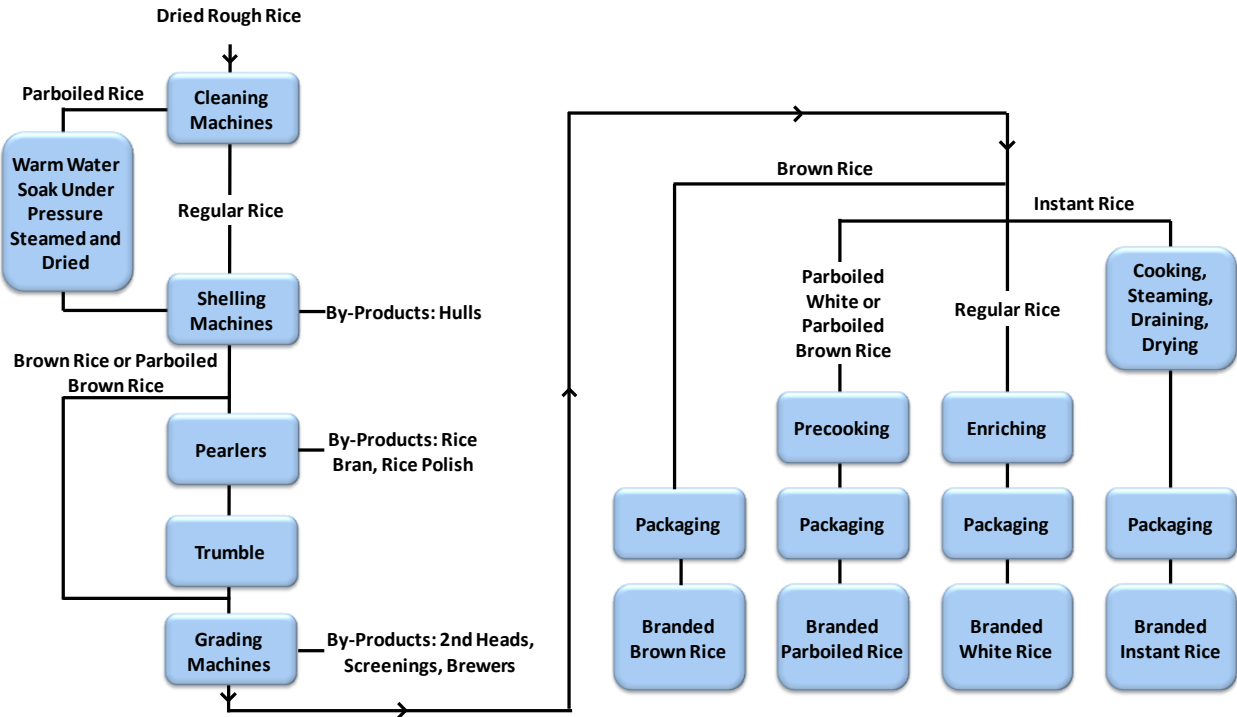


Figure 15. Rice Milling Process





Processors may process rice for producers or traders as a fee-based service or under contract to a wholesaler, or may buy paddy for processing and on-sale. Pest infestation by insects, rodents or birds is a threat during paddy storage. It can be controlled by fumigation, but millers may prefer to take the infestation losses for reasons of cost and convenience. Damaged rice is generally screened out during milling, leading to losses in the range of 10 percent.

Small-scale processing relies on small, portable milling machines (sometimes donated by the government or an NGO). Processing is generally of a low standard leading to yield losses and a product with significant levels of impurities and mixed whole and broken grains. The value of the actual milling service is generally low, with the main margins being made in the trading functions of purchasing paddy and then selling it as milled rice to rice traders. The small margins obtained from milling services serve as a disincentive to small millers to invest in improving their rice processing capacity.

In Nigeria, there is a class of medium-sized mills that are typically integrated with relatively large-scale paddy production operations (more than 15-20 hectares). Similarly in Mali, mini-rice mills provide hulling services to farmers and may also operate with polishers and graders capable of presenting a clean, polished product and sorting it into homogeneous lots by grain size. These mini-mills provide a superior product with higher yields than the more prevalent and cheaper, mobile hullers. Investment costs in mini-mills can be significant, however, varying from US \$5,000 to \$50,000 depending on the scale and range of functions (de-stoning, sorting, etc.) of the machinery. Currently their rate of market penetration is still small. Mini-mills have the added advantage of keeping the bran on farm, where it could be used for animal feed—although, currently, bran utilization is limited.

There are few modern milling facilities with the potential to produce cleaned and polished rice that can compete with imported product, and those that exist are underutilized because of problems with aggregating small volumes of domestically produced rice. In some countries, such as Nigeria, most of the few existing large mills are owned by government or quasi-government parastatals and have been poorly managed, maintained and utilized. Inconsistent policies and deficient infrastructure discourage private-sector investment in these large mills.<sup>136</sup> An unreliable electricity supply is often an additional constraint. Similarly in Liberia, the government has plans to revitalize some old milling facilities to stimulate productivity. However, in a number of countries—including Ghana and Nigeria—large, multinational companies are beginning to invest in such facilities with recent rises in rice demand and prices.

Parboiling is an important additional processing step in Nigeria, Benin, northern Ghana and other parts of West Africa, which adds significantly to the cost of the finished product. Parboiling is a particularly expensive procedure for processors located in peri-urban areas as a result of the high costs of firewood. It is generally conducted by the producers or a specialized, rural-based agent. The distribution of the various processing tasks among different operators can reduce risk to each, increasing the resilience of the value chain. However, improvements in rice quality consequently require simultaneous upgrading by actors at several stages in the chain.<sup>137</sup>

Most parboiling is carried out on an artisanal level, generally by women. Even in Nigeria, where parboiled rice is widely preferred, there are only two large mechanical parboilers, belonging to major industrial mills. In heavy production zones, clusters of small mills attract paddy traders and buyers and serve as parboiling, milling, cleaning and marketing hubs. Improved parboilers that can be constructed locally have been shown to improve the quality and increase the yields of milled rice while preserving nutritional content.<sup>138</sup> (Parboiling results in inward diffusion of water-soluble vitamins and is therefore more nutritious than non-parboiled white rice.<sup>139</sup>) Research conducted by the Africa Rice

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<sup>136</sup> Kormawa, “Module 15: Policies and Institutions for Promoting NERICA Rice Competitiveness in Sub-Saharan Africa.”

<sup>137</sup> Lançon, “Rice Processing in Nigeria: A Survey.”

<sup>138</sup> Matty Demont, Agricultural Economist at the Africa Rice Center, West Africa Rice e-Consultation, August 2009.

<sup>139</sup> Juliano, “Rice in Human Nutrition.”



Center in May 2009 in Glazoué, Benin found that consumers were, on average, willing to pay an additional 40-100 FCFA/kg (US \$0.09-\$0.22) for rice parboiled through improved parboiling technologies. Further, the improved parboiled rice was reaching urban consumers in Cotonou, illustrating the fact that consumers will sometimes seek out quality products and markets will establish themselves.<sup>140</sup> HANIGHA, a local private design shop in Kaduna, Nigeria has developed parboiling units for small-scale producers and millers that can yield four times as much as traditional methods.<sup>141</sup> However, the HANIGHA system requires a larger initial capital investment, and does not deliver uniform production quality—both of which present an obstacle to the wider dissemination of the system.

## 5. WHOLESALERS AND IMPORTERS

Wholesalers in many countries concentrate on the sale of various types of imported rice to a network of distributors and retailers in urban and peri-urban areas. In Mali, for example, despite consumer preference for fresher domestic rice, the logistical challenges of aggregating small product volumes in rural areas, combined with the added incentive of import tax exonerations, lead many wholesalers to trade principally in imported rice. However some wholesalers also buy locally produced rice from traders, processors or farmer associations.

Larger wholesales often also function as importers of rice and other cereals, and may brand some of the rice they sell. A small number of relatively large firms tend to dominate the importation and wholesale functions in the rice value chain of a given country. Typically these firms have more financial and business capacity than other actors in the rice value chain and may offer a range of payment terms to smaller retailers to facilitate consistent inventories and respond to cashflow constraints. In many countries, however, wholesale–retail networks are weak. In Liberia, importers/wholesalers maintain *de facto* grain reserves; the government ensures stocks equivalent to a six-month supply through the granting of licenses for rice imports. In Nigeria, some importers have invested in polishing plants to polish brown rice into finished white rice and on-sale into the market as a result of a temporary reduced duty regime for brown rice.

## 6. RETAILERS

Retailers usually buy rice from wholesalers in urban areas or traders travelling in from rural production areas, and they sell in open-air markets or in small grocery stores. In poorer and more rural areas, organized retail is less common and small, informal traders become more important. There is little specializing of retailers by quality or variety as they often deal in several types of imported and local rice. Retailers frequently offer rice in a variety of packaging and grades to cater to the needs and preferences of most socio-economic groups. In Mali, a new category of retailers is emerging, who buy directly from traders and hand-sort non-homogenous sacks of rice to produce pure extra long, large-grain and small-grain broken rice for sale by the kilogram or by the sack.

## B. SYSTEMIC CONSTRAINTS TO INDUSTRY COMPETITIVENESS

To date, rice value chains in West Africa have failed to achieve their considerable potential. Progress through upgrading is needed on many fronts, such as improvements in rice quality, increased efficiency through the uptake of appropriate technology, consumer acceptance of local rice and decreased post-harvest losses. For any of these upgrades to take hold, however, supportive government policies are needed, as well as strengthened horizontal and vertical partnerships based on trust, transparency and mutual benefits.

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<sup>140</sup> Matty Demont, Agricultural Economist at the Africa Rice Center, West Africa Rice e-Consultation, August 2009.

<sup>141</sup> National Cereals Research Institute. “Report on Financial Analysis of Rice Parboiling/Processing Systems in Bida Area, Niger State, Nigeria.”

## I. BUSINESS ENABLING ENVIRONMENT

Increasing domestic rice production to meet growing rice consumption and reduce rice imports has been a top priority for West African governments, and these governments have devoted significant resources toward that goal in the past 30 years.<sup>142</sup> In tracing the history of West African policies aimed at achieving sufficiency in rice pre- and post-structural adjustment programs (SAP), a 2009 presentation by WARDA researchers<sup>143</sup> entitled, “Rice Policy in Africa: What Went Wrong,” highlights the heavy role played by governments pre-SAP in buying and distributing imports and inputs, investing in infrastructure and ensuring access to credit. As suggested by the title of the presentation, the outcomes of these pre-SAP policies were disappointing in terms of improvements in productivity and return on investment.

Post-SAP, there was a shift from state-led development (end of 1980s) to a gradual liberalization of the rice economy in the 1990s. With the exception of Nigeria, production increases were substantial post-SAP, but largely from expansion of the harvested area. However consumption outpaced these increases, resulting in a progressive decline in the region’s self-sufficiency ratio. If the loss of ground *vis-à-vis* national rice self-sufficiency was not on government’s radar screen before, the “rice crisis” of 2008 raised its visibility. Most governments reacted by launching a rice self-sufficiency program that resembled the pre-SAP era. Aspects of these programs may have aided local production or encouraged local investment. However, on the whole they have been distortionary through i) subsidies that artificially lower production costs and crowd out private investment; ii) price controls that keep prices down; and iii) trade policies that are designed either to protect local production or keep prices of imports low. These programs have further bolstered certain existing constraints to the improved competitiveness of local production, and in particular to improved productivity. These constraints are discussed below.

### a. Mistrust of Markets as Compared to Government Intervention

Throughout West Africa, there is mistrust of markets both on the part of policymakers and of farmers. Market actors are seen as predatory, while government (however inefficient) is generally the preferred partner of the small farmer. This preference is understandable since government subsidies generally relieve smallholders of the normal risks of investing in agriculture, but such subsidies also exacerbate existing mistrust of markets. In Mali, this mistrust arose partially in response to the implementation of SAPs, which resulted in a sharp decline in public investment in agriculture and smallholder production. Liberalization resulted in winners and losers, and smallholders were for the most part losers. This mistrust may also have cultural roots.<sup>144</sup> Although liberalization in Mali has been relatively successful as compared to other countries in the region, the country-level rice value chain assessment (see attachment III) asserts: “There is a significant heritage of mutual distrust between actors in the value chain and in the enabling environment that inhibits market-based cooperation.” Similarly, the current enabling environment in much of the region has made the private sector and rural communities highly susceptible to signals sent by government and donors. These signals are sent directly in the form of free inputs, output purchases and investments in rice mills; and indirectly in the form of price setting, margin setting and pushing specific organizational structures such as cooperatives to access public goods services. Such signals crowd out the private sector, foster continued reliance on unsustainable structures, including donors, and devalue self investment in upgrading.

### b. Exclusive Focus on Production

Governments and donors alike have focused heavily on production, while ignoring the wider value chain—in particular, the need to invest in downstream processing and marketing. To illustrate, in Senegal, government investments in

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<sup>142</sup> Pearson, *Rice in West Africa: policy and economics*; Randolph, “The impact of structural adjustment programs on the West African rice economy.”

<sup>143</sup> Akande, “Rice Policy in Africa: What Went Wrong.”

<sup>144</sup> See Attachment III, Mali Value Chain Analysis.

fertilizer, finance and infrastructure have fostered subsistence rather than commercial production; while farmers' links to markets are unorganized, fragmented and inefficient. In Mali and Nigeria, production investments have been made by donor and government while processing has been largely neglected. Yet processing is critical to absorbing surpluses and producing a product that can compete with imports. Essentially, the lack of downstream investments creates a bottleneck as well as disincentives to improved productivity.

### **c. Focus on Tangible Constraints while Ignoring Intangibles**

Most governments and donors have focused their investments on tangible constraints, such as inputs, credit and infrastructure, ignoring less tangible issues such as trust and incentives. The business environment in many countries—in the form of unstable and even conflicting policies—creates disincentives for smallholders and larger private-sector lead firms to invest. In Nigeria, the government offered tax incentives to lead processing firms to invest in rice, only to renege on these promises the following year. At the same time, instability scares smallholders, who have the least ability to absorb risks from investing in improvements. The African Rice Center and FAO have focused on the lack of high-yielding varieties suitable to Africa, on high-yielding techniques such as SRI, and on improving soil nutrients to increase yields. However there are disincentives in rural areas to apply new technologies both because of unstable government policies, which can lead to short-term decision horizons in the form of side-selling and predatory behavior, and because of cultural norms that do not reward innovation or profiting more than one's neighbor.<sup>145</sup>

### **d. Lack of Transparency**

Government corruption, bribery and general lack of transparency in policies and processes affecting business are a constraint in many countries. In Liberia, high informal fees and random inspections add time and monetary costs to transactions, particularly affecting less well-connected smallholders. Nigeria's policy process is often dominated by rumors and assumptions of personal gain over national or state priorities or private-sector competitiveness. The process is made more complex by the multiple levels of policy at the national, state and local levels that can often run counter to one other, especially with regards to developing a functional and commercially oriented agricultural inputs sector. The inconsistency, arbitrariness and unpredictability of the policy arena in Nigeria cause risk-aversion and inefficiencies.<sup>146</sup> Surveys measuring bribery and inspection delays along primary trade corridors that link Ghana and Togo with landlocked Burkina Faso and Mali reveal that some reform has taken place in Ghana and Togo, but Mali remains a major site for bribery and delay.<sup>147</sup>

### **e. Land Tenure**

Reforming land tenure to encourage investments in irrigation infrastructure is key to domestic rice competitiveness. In Nigeria, government land ownership makes using land as collateral difficult. In Ghana, untangling issues of government acquisitions and joint ownership of land seriously impedes investments in the land. In Mali's Office du Niger zone, the lack of secure land rights contributes to reduced yields and lower paddy quality. In Liberia, which has a dual system of land tenure, a 2006 survey showed that about one third of agricultural households had little or no access to land. In the irrigated rice area in Senegal, land is usually rented by villages, so producers never own the land but have the right to cultivate it. Producers who leave their land uncultivated lose that right. While such tenure is incompatible with the degree of investment required for individual irrigated rice cultivation, it is compatible with the communal character of irrigated rice perimeters requiring collective action.<sup>148</sup>

Land tenure issues play a role in gendered responses to economic incentives for increasing production and sales of staple foods. In Liberia, a woman's access to her husband's land is based on the assumption that she grows food to

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<sup>145</sup> See Attachment II, Liberia Rice Value Chain Analysis.

<sup>146</sup> Greg Vaut, Senior Associate for Agriculture & Economic Growth, ARD, Inc. West Africa Rice e-Consultation, August 2009.

<sup>147</sup> USAID. "Improved Road Transport Governance on Primary Corridors, Results of surveys taken Jan. 1 to March 31, 2009"

<sup>148</sup> Matty Demont, Agricultural Economist at the Africa Rice Center, West Africa Rice e-Consultation, August 2009.

feed the household. When women begin to sell crops—and because the income is theirs to allocate—their free use of the land may be restricted. Thus, commercializing crops typically grown for household consumption can jeopardize women's ability to utilize their husbands' land for farming. While there is some elasticity in these systems of household division of labor and resources, they are a non-economic factor that limits the potential for producers to respond to economic incentives to increase production and sales.

#### **f. Infrastructure**

According to the World Bank's investment climate assessment of Nigeria, the most binding constraint to greater and more widespread private investment in agriculture is deficient infrastructure (power and transport). Throughout much of the region, inadequate transportation and energy infrastructure contribute to the high costs, poor quality and limited market penetration of domestic rice production. In Liberia, domestic traders and producers often cite the poor conditions of feeder roads as a major obstacle to the flow of rice to markets. Many mills are abandoned, inefficient or under-utilized and warehouses are in varying degrees of disrepair. In both Liberia and Ghana, lack of reliable electricity is a major constraint for milling that must be addressed before investing in new milling infrastructure.

## **2. VERTICAL LINKAGES**

The term "vertical linkages" in value chains refers to the strength of vertical cooperation amongst value chain actors: i) in getting a product from input supply to consumer; ii) in transmitting information (prices, quality requirements and quantities demanded) from buyers down the chain to suppliers; iii) in conveying incentives from buyers willing to pay a premium for quality products to suppliers; and iv) in informing producers of input suppliers' willingness to provide technical information or extension services for commercial purposes. Even where this information does flow easily up and down the chain, a lack of trust is an obstacle to vertical coordination. Where the relationships between actors vertically linked in value chains are lacking in trust or social capital, the competitiveness of the value chain can be compromised.

Throughout West Africa, the vertical linkages of rice value chains are unorganized or fragmented due both to poor infrastructure as well as a distrust on the part of farmers of markets in general and private sector actors such as buyers, traders and input suppliers in particular. In many countries, rice is highly politicized, due to its importance to national food security and to the diet of the population in many countries like Nigeria, Liberia and Senegal. The history of government intervention in rice—including input subsidy programs—has generated a mistrust of commercial relationships, created disincentives for investment and led to a disabling business environment that results in a high cost of doing business. This disabling environment also translates into i) the ineffective transfer of information, including market signals that might stimulate improvements in product quality, ii) unclear incentives for investing in new technologies to improve productivity, and iii) limited engagement between producers and larger buyers.

These problems result in weak vertical coordination, low yields and very high costs of production as compared to Asia. To address these problems, governments and donors have focused investments on production, ignoring the importance of the vertical chain. For example, donors and the government have made substantial infrastructure investments in the Senegal River Valley region. Yet rice producers there largely view rice as a subsistence crop. Marketing is not well organized and the volumes marketed are not great, despite excellent yields and unmet demand for the high quality rice produced. In Nigeria, rice is seen as a commercial crop. However, poor infrastructure, high transport costs, inadequate investment in processing, and predatory behavior among value chain actors result in weak vertical coordination and very high costs.

Further details of vertical linkages are provided below for Liberia, Nigeria, Mali and Ghana:

- *In Liberia*, rice value chain development has languished, as evidenced by substantial gaps in the input, production, post-harvest, processing and aggregation functions, while rubber and palm have rebounded quickly in the post-

conflict environment. With little private investment, the vertical relationships that have formed in the rice sector are short-term in nature and driven by adversarial negotiating perspectives, leading to a high degree of distrust between value chain actors. Most farmers perceive rice as a safety net crop and are unlikely to make substantial investments in improved productivity, which would require a stronger input industry than currently exists to extend products and services into the community. Yet for a small but growing segment of farmers that want to become more commercial and could form the foundation for a future private-sector value chain, weak vertical linkages are an obstacle to getting the information they need to effectively target urban rice consumers. The lack of information transmitted down the chain also prevents input suppliers from being able to deliver seeds and other inputs at the right volumes and price, and farmers from getting the knowledge needed to make informed investment decisions.

- *In Nigeria* vertical linkages are fragmented, with limited coordination among actors at different levels. This fragmentation is partly the result of the high costs of transport and the resulting relative distance between actors in the value chain; and it is partly the result of decisions made by actors all along the chain based on short-term gain rather than longer-term business relationships. For example, despite seemingly compelling incentives for farmers and millers to cooperate (i.e., millers need significantly more paddy than they are getting from farmers, and farmers are able to increase their productivity and returns by working with millers), little cooperation takes place. Rather millers, who often discount prices for paddy because of the low quality, are perpetually challenged as they attempt to ensure that farmers deliver their entire production at the agreed upon price. Transparent mechanisms to build trust between the two parties and reinforce a mutually beneficial relationship are necessary for developing an efficient supply channel.
- *Mali* is identified by some experts as the exception in the region in terms of the competitiveness of its local rice *vis-à-vis* imports. While Malian rice producers cannot yet meet the country's demand for rice, they come closer than producers in most other countries in the region. Yet Mali has a legacy of heavy state intervention in the rice value chain that can still be felt. Cereals market liberalization in the 1990s introduced free contracting between private buyers and farmers, either individually or through village associations. The liberalization process, coupled with the devaluation of the FCFA, has been critical to improving the returns to farmers in the Office du Niger zone. However, this shift from government control to liberalization included many problems concerning private-sector involvement in the value chain that left farmers and public authorities with an underlying mistrust of market mechanisms and of the private sector in general. Not only are farmers and traders suspicious of each other, but there is a nexus of intermediating institutions—including farmer organizations of variable quality and motivations, politicians, donor projects and the Office du Niger itself—which all influence the incentive structures facing actors in the value chain. This web of complex, overlapping relationships poses a real challenge to efforts to develop clearer incentives for improving product quality. Actors at all levels have multiple commercial options and strategies for maximizing their private returns by obtaining favorable treatment from farmer organizations, politicians, the Office du Niger or donor-funded projects. This constrains increased vertical coordination and provides motivation for politicians to become involved in commercial negotiations in the name of protecting farmers.
- *In Ghana*, the situation is somewhat different. The rice value chain includes well-established vertical linkages in the market channel producing local rice, where social capital and trust are strong. However, this vertical cooperation does not exist in the emerging import substitution channel, where local production focuses on aromatic varieties. The shift to import substitution can be highly profitable, but it requires i) access to improved seed and inputs; ii) the introduction of labor-saving and yield-maximizing technologies such as transplanters, harvesters and threshers; iii) injections of capital; iv) a high level of trust among the different participants to facilitate these investments; and v) compliance with agreements to enforce trust. Such a shift is forging new and untested business relationships and is increasing risk.



The result of weak vertical linkages in all of these cases is a rice value chain that has difficulty in cost-effectively getting product to market in the volumes and of the quality demanded by buyers and needed to increase food security. Yet governments and donors in the region have focused almost exclusively on the technology needed to improve productivity. While important, this focus on production technologies overlooks the quality of vertical relationships that are fundamental to value chain competitiveness. The importance of these relationships was expressed by experts during USAID's e-consultation on the West Africa rice value chain: "Transplanting, irrigation, seeds varieties, etc., are available and have been for any farmer interested. The issue is the relational networks."<sup>149</sup>

### 3. HORIZONTAL LINKAGES

In a value chain, horizontal linkages are longer-term cooperative arrangements among firms that involve interdependence, trust and resource pooling in order to jointly accomplish common goals. Both formal and informal horizontal linkages can help reduce transaction costs, create economies of scale and contribute to the increased efficiency and competitiveness of an industry. In addition to lowering the cost of inputs and services (including financial services), inter-firm horizontal linkages can contribute to shared skills and resources and enhance product quality through common production standards. Such linkages also facilitate collective learning and risk sharing while increasing the potential for upgrading and innovation. Smallholder producer groups have strong potential to increase farmers' bargaining power in the marketplace, while processors, suppliers and traders may also form their own groups to strengthen their position within industries.

The strengths and weaknesses of horizontal linkages in West Africa's rice value chains, as well as the resultant constraints to improved competitiveness and productivity, are illustrated below:

- *In Ghana*, linkages are weak in all channels among firms performing similar functions. In the imported rice chain channel, importers acknowledge each other and exhibit some collaborative behavior to reduce or limit import duties, but otherwise do not cooperate. They are competitors and operate independently from each other. The channel through which local rice is sold has weak linkages among farmers, millers and others performing similar functions. Aggregators or brokers compete to secure paddy from farmers, who too often engage in side-selling, often encouraged by the aggregator or broker: sometimes aggregators pay higher prices to farmers even after their production has been pre-financed by another aggregator. Such practices are detrimental to the competitiveness of the chain and, in the long run, everyone loses. At the production level in the local rice industry, there are traditional labor-sharing networks in which producer group members (and sometimes loosely related farmers) will share labor and, less frequently, will come together to purchase inputs. While there have been numerous efforts to strengthen producer groups, whether cooperatives or farmer-based organizations, most of these efforts have made the mistake of training groups of farmers in isolation and have been less focused on facilitating the development of networks between farmers and the input and equipment suppliers, buyers and financial institutions essential to upgrading the chain.
- *In Nigeria*, farmers' groups are weak organizations, mainly formed by the government to serve as conduits for delivering services to farmers, rather than as institutions governed by farmers themselves. Groups organized by the Olam mill—the lead firm with which USAID is working—are also weak. Olam's interest is in grouping farmers to deliver product, rather than enhancing their bargaining power.
- *In Liberia*, in some communities, farmers have revitalized traditional forms of cooperation, primarily to manage labor shortages that are tied to slash-and-burn extensive agricultural practices. These informal forms of coopera-

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<sup>149</sup> Michael Field, Liberia Chief of Party for ACDI/VOCA, West Africa Rice e-Consultation, August 2009



tion could be harnessed to reduce transaction costs around the purchase of inputs and the marketing of production, although any efforts to this end should consider local preferences for or against cooperation. The government and donors are pushing for the formation of farmers' cooperatives, initially by revitalizing pre-war cooperatives, but these efforts are meeting with limited success due to a number of concerns. First, the formalization process is often driven by a need to access assets and resources, creating an unsustainable driver of cooperation. The World Food Programme (WFP) and the government of Liberia have established rules where only selected formal cooperatives that have registered with the Cooperative Development Agency can access the Purchase for Progress program. This initiative is distorting incentives in the market place, creating real or perceived political favoritism of certain farmers over others and sending unintended price signals. The second concern is that many donors push cooperative organizations in order to balance power between farmers and traders or input firms, resulting in reinforcement of the perception of the private sector as adversarial to farmers. This further distances producers from the private sector rather than creating interest among buyers and input providers to invest in and establish more effective relationships with the farmers.

- *In Senegal*, horizontal linkages are strong among producers on irrigated perimeters established by the government in the Senegal River Valley. As required by the government in order to receive assistance, producers cooperate to manage the land, operate irrigation infrastructure, make bulk purchases of key inputs and undertake marketing to repay production credit. However, collective marketing is the weakest function carried out by these associations, as their efforts are almost exclusively restricted to selling just enough of each farmer's harvest to repay their individual loans. This generates a minimum level of revenue rather than maximizing individual profits. Coordination and aggregation are also weak at other points in the chain, including trading and processing, because of limited working capital.
- *In Mali*, at the time of market liberalization, market incentives were not yet clear to the main actors, and appropriate institutional structures—in particular, strong farmer organizations—were not in place to provide well functioning horizontal linkages among the many smallholder farmers. Such horizontal linkages could have provided points of leverage to buyers and service providers. Nonetheless, farmer organizations now play a critical role in reducing transaction costs for suppliers of support services as well as in aggregating small farmer production. Yet, the quality of Malian farmer organizations is extremely variable, with many experiencing governance problems and virtually all requiring significant levels of assistance to become sustainable. This is particularly true in the Office du Niger zone, where a history of bad debt and heavy subsidization has undermined notions of budgetary discipline and accountability in many farmer organizations. Outside of the Office du Niger, most family farmers are asset poor, and credit for improved inputs is a serious constraint to production. Solutions to this constraint lie in strengthening horizontal linkages among farmers via farmer organizations and helping local microfinance institutions to develop appropriate credit products.

These cases demonstrate the importance of horizontal linkages in the form of producer organizations for aggregating produce and reducing a range of transactions costs. They also offer evidence that producer organizations are strongest where government has organized groups for receiving subsidies or government investment resources, as in the case of Senegal; or where there is a tradition of cooperation as in the case of Liberia. While the latter offer opportunities for building horizontal linkages that facilitate commercial activity, the former undermine the cooperation so critical to competitive value chains.

#### 4. SUPPORT MARKETS

Years of government and donor interventions have crowded out private-sector investment in the input supply sector as well as in post-harvest handling and processing in many West African countries. This has led to a limited supply of

necessary inputs and services, leading to low-quality, but expensive paddy, which in turn forces millers to bring a low-quality product to market at a low margin—creating little incentive for investment in processing technologies.<sup>150</sup>

#### **a. Input Supply**

The capacity of input supply sectors and their distribution networks must be strengthened to improve smallholders' access to higher quality seed, fertilizer and equipment.

**Seed:** The seed sector in some countries in West Africa is subject to extensive government intervention and control. There is an appropriate role for the government in linking research and commercial production, as well as in certification oversight. However, in countries such as Ghana and Liberia, the private sector has little or no involvement in the multiplication and distribution of seed. This contrasts sharply with Mali, where seed production is a profitable private-sector business. In other countries, including Nigeria, the problem is not with the availability of certified rice seed, but with the tradition of retaining unimproved paddy for seed. Some experts argue that farmers do not need to purchase more than 2-5 percent of their seed each year: If formal sector seed companies produce and sell certified seed in small packets to farmers, these farmers can then produce next generation seed.<sup>151</sup>

In many countries in West Africa, women trade seeds: for example women in Ghana exchange seeds with villages as far away as Burkina Faso or Togo.<sup>152</sup> Female Kpelle rice growers in Liberia use and recognize up to 100 different varieties of rice.<sup>153</sup> In Senegal, it is the women who select the rice seed and distinguish different varieties.<sup>154</sup> A 1997 study in Mali found that women there could identify 30 different rice varieties by growth cycle, plant growth habit, plant height, stems, grain yield and size, shape, color, cooking characteristics and taste, while men had little knowledge of traditional varieties.<sup>155</sup> Extension and education interventions that deal with input supply should build on this skill to keep women at the forefront of knowledge on inputs.

**Fertilizer:** Across the region, government subsidy programs have had a detrimental effect on private-sector provision of fertilizer. In some countries, the government or donors directly import and distribute fertilizers; in others, the government and donors have become the main clients of private-sector importers. Political patronage and/or poor targeting have resulted in fertilizer being largely unavailable in many production areas. Meanwhile, the uncertainty caused by seemingly *ad hoc* fertilizer subsidy programs has led to a lack of private-sector investment in dealer networks to reach these areas. Existing networks are weak and do not help farmers to learn and upgrade, and therefore known solutions have not reached farmers.<sup>156</sup> With inadequate extension advice, farmers do not know how to correctly apply fertilizer. Even in Mali's Office du Niger, where farmers are organized and access inputs through bulk orders, a lack of competition among importers leads to complaints of collusion and poor quality control.

**Equipment:** Crowding out of private investment has also affected access to equipment for harvest and post-harvest functions. Increasing smallholder production and improving paddy quality will require mechanization, which is currently at a low level in many West Africa countries. Manual threshing and sun drying leading to over-drying can significantly reduce the quality of paddy and increase the presence of impurities.

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<sup>150</sup> Matty Demont, Agricultural Economist at the Africa Rice Center, West Africa Rice e-Consultation, August 2009

<sup>151</sup> Tom Remington, Principal Agriculture Advisor for CRS, West Africa Rice e-Consultation, August 2009

<sup>152</sup> Kranjac-Berisavljevic, "Women of Ghana challenge trend toward modern rice varieties."

<sup>153</sup> Sachs, *Gendered Fields: Rural Women, Agriculture, and Environment*. Boulder.

<sup>154</sup> Linares, "African rice (*Oryza glaberrima*)."

<sup>155</sup> Synnevag, "Gender differentiated management of local crop genetic resources in Bafoulabe Cercle, Kayes region of Mali."

<sup>156</sup> Tom Remington, CRS and Michel Field, ACIDI/VOCA, West Africa Rice e-Consultation, August 2009

In Nigeria, a commercial market for mechanization services is emerging, but smallholders still largely lack access to tractors, reapers and threshers. The same is largely true of Ghana, particularly in the north of the country. The ability of farmers and millers to purchase mechanized equipment is limited by their lack of access to finance and a poor understanding of the return on investment that could be obtained through mechanization.

Given women's responsibility for the majority of the labor-intensive tasks in rice production, access to new technologies, training and extension must be oriented toward women in order to increase productivity and food security.<sup>157</sup> When farm tasks are mechanized and become more profitable, women can lose access and control if the technology is not developed and introduced in an appropriate way.<sup>158</sup> An example of appropriate technology geared toward women's needs comes from the Philippines, where the IRRI successfully developed a small dehulling machine to reduce time spent on that particular task.<sup>159</sup> The incentives and response to interventions may be affected by gender considerations, so they should be well understood and accounted for prior to intervening.

## **b. Extension Services**

Public irrigation schemes in Senegal and Mali have government-mandated institutions to provide extension services as well as farmer organizations in some areas that strengthen the delivery of these services. Such extension advice has contributed significantly to high yields in these areas. However, this success has crowded out information provision from any private-sector actors such as buyers or input suppliers.

In most countries within the region, extension services outside of public irrigation schemes are virtually non-existent. Government extension services have limited staff capacity and funding, and have little incentive to improve outreach. Donor-funded, project-based extension systems provide virtually the only vehicles for extension, given the lack of adequate input-supply dealer networks. As a result, although technical packages exist for the various rice production systems, this information does not reach many farmers and investment in research fails to translate into increased yields. In addition, research is not always linked to market demand, leading to the promotion among commercially oriented farmers of varieties that cannot compete with imports.<sup>160</sup>

## **c. Access to Finance**

While the financial services available vary by country, limited access to finance is a common constraint to upgrading in the production and processing functions in many West African countries. Prohibitive collateral requirements and underdeveloped financial sectors that lack knowledge of appropriate products and mechanisms for agriculture are two major constraints in accessing financing. Where financial services do exist, ambiguous or nonexistent land tenure rights make accessing credit difficult. In Nigeria, the burdensome process of transferring ownership makes it difficult to use land as collateral and this has reduced farmers' access to credit.<sup>161</sup> Lack of access to finance is also related to weak horizon-

In Nigeria, PrOpCom is linking small-scale processors to a new lease finance provider and subsidized market advice. The objective is for lead firms to update their machines, resulting in a higher quality product capable of fetching up to a 20 percent higher price. Once this is demonstrated, it is expected that others will follow in accessing finance and market advice to upgrade processing.

tal and vertical linkages: opportunities exist in some countries to strengthen farmer organizations and improve embedded finance through vertical relationships. In other countries, such as Liberia, the near-term goal of improving

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<sup>157</sup> Ezumah, "Agricultural development in the age of sustainability."

<sup>158</sup> Paris, "Technology."

<sup>159</sup> Huvio, "Women's Role in Rice Farming."

<sup>160</sup> See Attachment I, Ghana Rice Value Chain Analysis.

<sup>161</sup> See Attachment IV, Nigeria Rice Value Chain Analysis.

access to finance should be alleviating cash-flow constraints for actors who can drive gains in productivity and upgrading, rather than for subsistence farmers.

#### **d. Processing Services**

No country in West Africa has a well developed processing infrastructure. Many of the small mills that dominate in West Africa are operating 30-year old machines. The Malian rice industry, for example, lacks well-performing service providers in the area of hulling, polishing and sorting. Mini-mills represent a timid attempt to develop such a service, but their rate of penetration in the market is quite small. In many instances throughout the region, government policies have crowded out or created disincentives for private-sector investment in processing. In other instances, processors cannot get sufficient supplies of raw material to operate at a profit. In Nigeria, millers have indicated that expected margins make investments in processing equipment profitable, however they are constrained by a limited supply of quality paddy and lack of financial services.<sup>162</sup> Similarly, in Senegal processors demonstrated interest in functional upgrading but were constrained by both access to credit and a reliable supply of paddy.<sup>163</sup> In Mali, continuous supply of poor quality paddy has led many millers to purchase and refine rice previously milled by mobile hullers rather than new paddy. This process ensures that the rice they purchase is of reasonable quality, however it can add significantly to the cost of production.<sup>164</sup>

Limited supply of quality and affordable paddy, limited access to affordable equipment, and little access to finance begin to explain why local rice continues to be marketed at low quality levels (cleanliness and homogeneity). In most countries, these negative traits overwhelm the competitive potential that could be derived from positive characteristics such as freshness. In countries where freshness is a key criterion, however, such as Mali, local rice is competitive in the market place.

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<sup>162</sup> Correspondence with Ibrahim Bamba, August 2009.

<sup>163</sup> See Attachment V, Senegal Rice Value Chain Analysis.

<sup>164</sup> See Attachment III, Mali Rice Value Chain Analysis.

# V. STRATEGY FOR UPGRADING AND RECOMMENDATIONS

## A. TEN-YEAR VISION

By 2020, large volumes of rice will be produced in areas of West Africa that have a competitive advantage—meaning favorable growing conditions, a business environment supportive of the private sector, and a private sector with the leadership and willingness to invest in upgrading. From these areas of competitive advantage, surpluses of rice will flow through regional commercial networks to deficit areas, thereby providing a consistent and price-competitive supply to urban markets.

West African rice will be differentiated to meet the quality and price demands of various market segments, and will capture a 50 percent share of these markets, roughly halving the current dependency on rice imported from Asia.

Regional networks will have emerged that can generate and disseminate the learning and upgrading that allow for adaption to changing market conditions and that result in income gains to a wide base of the population.

Governments in countries of competitive advantage will play a critical role as enabling-environment facilitators by adhering to predictable policies that support rather than supplant the private sector; as such, they will also serve as models for other countries in the region interested in creating an enabling environment that ensures food security.

In other areas with less commercial potential, commercial rice value chains will be complemented by steadily improving rice production by subsistence farmers who increasingly market rice or cash crops, and in some cases, graduate to become part of modern commercial value chains. Food security in these areas will be based on the efficient production of a range of food crops as well as on a growing agro-industry that can process these commodities into products that meet market demand. Food security (as it relates to rice) will be based on a competitive market place with multiple sources of rice (competitive production in West Africa alongside imports), smooth flows of rice from surplus countries to deficit countries, and safety stock policies that do not distort the market.

## B. STRATEGY FOR REALIZING THIS VISION

A food security strategy for rice in West Africa has three distinct but complementary components that will need to be balanced in a resource-constrained environment.

*First*, national value chain competitiveness strategies are required to ensure the **supply** of rice in the quantity and quality needed to effectively compete with imported rice in West Africa's urban markets. While varying in detail by country, national competitiveness strategies will largely be based on the creation of commercial networks characterized by concentrated areas of production (mostly irrigated), market-oriented farmers and significant investments in storage, processing and marketing. The establishment of these commercial networks implies a time-consuming process of building trust between value chain stakeholders so that mutually beneficial business models emerge. It also implies a government policy shift to a more market-based approach to food security in which competitive markets ensure the supply of staple foods at the most competitive consumer price.

*Second*, national rural rice food security strategies focused on **access to food** are needed to improve productivity for the majority of more widely dispersed subsistence rice producers mainly operating under rain-fed production systems. At its core, this strategy takes an incremental and partially subsidized approach to the introduction of basic production and post-harvest handling technologies (providing a demonstration effect for replication), as well as non-distortive

approaches to developing links between subsistence farmers and a commercial input distribution system.<sup>165</sup> Current disincentives to improved rice production will also need to be addressed, including insecure land tenure, dependency on government or donor assistance, and adverse cultural norms such as mistrust of the private sector, reticence to invest in food crops, gender-based constraints, etc. A combination of increased sales of cash crops and capital asset building (savings) will positively affect sustainability and the graduation of farmers from subsistence to market-oriented production. Such rural food security strategies should focus on a number of different food crops important for nutrition and calorific intake, rather than on rice in isolation. (Indeed, in certain countries, rice is not a major component of rural diets and will not be part of this strategy.)

*Third*, a focus on **distribution** is needed to facilitate rice flows and learning throughout the region. This will initially increase flows for imported rice that is already in the market and thus create a more competitive environment for local rice. However, regional trade improvements will eventually be needed to exploit competitive advantages within West Africa that facilitate trade from “centers of excellence” characterized by comparative advantages and the political and commercial will to upgrade, to the major deficit areas in the region. Moreover, shared learning (that goes beyond the exchange of documents) will ensure that lessons in one country are applied elsewhere. Lessons may include how best to promote sustainable input supply, how to address mistrust, and what technologies are most effective for drying, threshing and milling.

These three rice food security strategies complement each other and create synergies: combined, they will lead to dramatically increased local rice production sourced from a large number of suppliers and efficiently flowing throughout the West Africa region.

## **I. NATIONAL RICE VALUE CHAIN COMPETITIVENESS STRATEGIES—SUPPLY**

Improving rice food security at the national and regional levels can only be achieved if commercial rice value chains produce a product that can compete with imported rice in urban markets in terms of the quality, price and delivery format.

Commercial rice value chains will have to be built around concentrated areas of irrigated or high-potential lowland production using intensive production systems characterized by improved varieties, land consolidation, the use of tractors and other forms of mechanization, high input use, double cropping, and so on. Such areas can produce rice in the volumes needed to attract investments in post-harvest handling (processing and storage), which is essential to producing a competitive product. The development of a commercial rice value chain will also create jobs, particularly in rural areas, and thus positively impact the accessibility aspect of food security since more rural inhabitants will have money to buy food.

Different countries are at different stages of development of the rice value chain, are moving at different paces and in different directions, and are in different situations regarding rice as a food safety net crop. Specific competitiveness strategies will therefore differ by country, as the case studies for Mali, Nigeria, Senegal, Liberia and Ghana in this report illustrate in detail. Nevertheless, several essential, mutually reinforcing competitiveness strategy elements can be distinguished (in successive order of implementation). These include the following:

### **a. Improved Business Enabling Environment**

A stable policy environment, public investments in infrastructure (primary irrigation, roads, etc.), and secured access to resources (most notably clear land titles), are required to attract the necessary investments in upgrading by market-oriented farmers and large processing firms. In their development strategies, governments need to move beyond fo-

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<sup>165</sup> Such approaches could employ, for example, a voucher system that provides time-bound, declining subsidies to offset the risk of investing in inputs and services.



cusing solely on production and farmer organizations and recognize the critical role played by private firms in the post-harvest handling and marketing of rice in West Africa.

#### **b. New Business Models**

Marketing margins in local rice production are sufficiently high to facilitate sustainable upgrading, but upgrading will only occur if all value chain actors expect to benefit as a result. This implies a need for business models that represent mutually beneficial (“win-win”) solutions together with strategies to ensure information sharing and incentive structures to build trust between farmers and larger private-sector agents such as wholesalers or processors. Business model solutions can take on the form of outgrower schemes managed by lead firms (processors or large farms) that include extension and credit, as is currently being tried out in Nigeria with donor funding; or of simplified third-party managed warehouse receipt systems that benefit both producers and processors. Whatever the business model chosen, some functional specialization will be needed. While organizing smallholder producers in some form is essential for aggregation, in the high-risk economic environment of West Africa, careful consideration needs to be given to the technical or economic logic for integrating climate, technology and market risks into one farmer organization. In many cases, formal farmer organizations taking on a broad range of value chain activities may not represent the best option.

#### **c. Increased Production**

Increased volumes are necessary for an efficient processing industry and to achieve price-competitiveness in the market place. Stimulating this supply response will require i) the use of meeting fora, transparent price-setting mechanisms, standards, effective dispute resolution mechanisms, and other tools that build trust, and ii) an appropriate incentive structure, for example bonuses or non-monetary benefits for larger volumes, higher quality and supplier loyalty. From a technology point of view, increasing volumes will require better inputs (improved seeds, fertilizer, etc.), expanded irrigation, ensured access to land, and a reduction in losses through improved pre- and post-harvest practices, as well as improvements in yields. In turn, this will require facilitating the emergence of support firms providing, on a commercial basis, targeted inputs (e.g., seeds), services (e.g., spraying), technical advice, storage solutions and financial products. In the presence of sufficient demand, this can be achieved through various models, including order-aggregating agents based in production areas, embedded services in supply contracts, or group activity. However, this will require a simultaneous withdrawal of direct government involvement and a shift in the mindset of farmers away from viewing these products and services as free public goods.

#### **d. Aggregation**

Aggregation is critical to an efficient value chain and will require business models able to profitably aggregate production matched with trust developed amongst value chain actors. Without aggregation, including adequate storage, the rice distribution system has no entry points from which to place orders year-round in a way that is as efficient and responsive to changing market demands as ordering imported rice. Incentives for horizontal collaboration amongst farmers should be based not on a desire to access government or donor support, but rather on exploiting the benefits of an improved bargaining positioning, market access, learning, risk reduction and resource sharing in the context of commercial linkages to the private sector (input suppliers, service providers, warehouse operators, processors and wholesalers). The business model has to create the incentive structure that makes individual side-selling an unattractive option to farmers relative to marketing as a group in a more long-term, contractual relationship with a key private-sector buyer.

#### **e. Improved Quality**

Meeting the end-market’s quality standards will require improvements throughout the value chain. It implies improved agricultural practices, inputs (e.g., seed varieties) and post-harvest handling (threshing, drying, sorting and storage) at the farm level to deliver quality paddy. It will require investment in improved milling technologies fed by sufficiently large, well-sorted quality paddy, and appropriate packaging at the processing level. Finally, it will require market diffe-

rentiation strategies that can reward the production of consistent, high-quality rice, thereby creating the incentives for upgrading throughout the chain.

#### **f. Clear Marketing Strategy and Promotion**

A market strategy is needed to ensure that improvements in local rice production result in a rice product that meets the specific demands of the consumer and that changes the perceptions of the quality of local rice in those markets in West Africa where such perceptions are negative. The competitive situation will differ from one urban market to another. Consumer preferences are multi-faceted and heterogeneous and need to be understood throughout the value chain.

#### **g. General Principles**

Five additional general aspects need to be taken into account in developing a national rice value chain competitiveness strategy:

- The overall approach must be **systemic**, i.e., the essential strategy elements above have to be addressed simultaneously using sustainable solutions. If any element is not addressed using profitable business models with risk levels the value chain actors are willing to accept, the strategy will fall short of achieving its objectives of competitiveness and improving national food security. Increasing production for example, will have little effect if the quality standard consumers expect is not met. Likewise, producing small quantities of quality rice will fail in the market as consumers will revert to more reliably available imported rice. Even if large volumes of quality local rice are produced, success in the market place will depend on an effective promotion campaign. However, the biggest challenge lays not in increasing production or achieving a sufficiently high quality level, but in commercializing dispersed production. Business models are needed that link this dispersed production to the sales points where the (imported) rice distribution system can tap into them. This will require an alignment of incentives through effective vertical and horizontal linkages and the establishment of appropriate value chain governance mechanisms. Establishing successful business models also requires a stable operating environment that does not induce volatility, thereby distorting these incentive structures. Finance and technology solutions will be driven by these business models.
- **Women** play a key role in rice seed production, cultivation, storage, processing and marketing. For example, developing commercial rice value chains may result in women changing from rice managers to rice laborers with higher incomes and improved child nutrition, but this needs to be addressed, monitored and ensured.
- It is important to take **civil society and communities** into account and make them an intrinsic part of public-private partnerships. Many communities have a deep-seated mistrust of the private sector and many private-sector firms do not understand the value of longer-term relationships with the communities from which they source paddy. Bringing together communities and both the public and private sectors can facilitate an appreciation of the value of learning and upgrading and the formation of commercially defined relationships that demand performance.
- **Finance for working capital and investment** is a key issue and includes elements such as financing incremental technology improvements through group saving and lending schemes, developing and delivering new commercial loan products that provide tailored solutions for the various small actors and service providers in the rice value chain, storage financing and the collateralization of rice stocks, financing inputs through outgrower schemes, and public investment in the primary components of large irrigation infrastructure, amongst others.
- Finally, it is important to have a realistic **time horizon** in terms of what a strategy can achieve. Short-, medium- and long-term strategy elements can be distinguished. In the short term (first five years), the focus has to be more on systemic constraints (removing policy bottlenecks, building trust, improving transparency through better in-

formation access and communication and reducing perceived risk-levels through smart subsidies). Achieving desired higher levels of rice self-sufficiency are for most countries in West Africa more long-term goals (10 years), as they imply investments and a scaling up of business models, which takes time.

***Recommendation #1: Invest in “centers of excellence” able to produce rice that is competitive with imports and in sufficient supply to feed urban and other populations that rely on imports. Selection of centers for investment should include not only comparative advantage for growing rice in the quality and quantity demanded, but also competitive advantage in terms of the enabling environment provided by government, and the leadership and willingness of the private sector to invest in upgrading.***

## 2. NATIONAL RURAL RICE FOOD SECURITY STRATEGIES—ACCESS TO FOOD

The vast majority of rice producers in West Africa are smallholders operating across a wide area and using extensive rain-fed rice production systems (upland or lowland). These are mainly subsistence farmers, for whom rice is first for consumption and secondly a critical savings tool in the household’s cash flow management. Small quantities of rice marketed widely, dispersed in both time and place, imply prohibitively high transaction costs that largely exclude these farmers from investments made by commercial rice value chain actors such as processors and traders. For these farmers, increased food security implies improved productivity of staple crops for consumption and of cash crops for sale. A number of off-the-shelf technologies are available that allow for an incremental development strategy (see text box), but these technologies will only be adopted if less tangible issues that create disincentives for adoption are also addressed. This may include strengthening communication, promoting transparency and supporting alternative dispute resolution systems to build trust between smallholder farmers and private-sector firms. Other interventions could include developing risk-sharing mechanisms to overcome reticence towards innovation or investment, or collaborating with community leaders to bring about change in local cultural norms that constrain competitiveness.

### Off-the-Shelf Production Technologies

- The introduction of new seed varieties such as NERICA (supplied by new or improved seed companies)
- The increased use of nitrogen fertilizer (urea)
- The use of local oxen with modified local plowing equipment
- Improved water control systems that use the landscape’s existing hydrology
- Improved transplanting and threshing technologies using small mechanization equipment currently available from countries such as South Korea

While high transaction costs make delivery of technical solutions by commercial input and service suppliers difficult, order-aggregating agents based in rural villages can help establish a commercially viable link between the farmers as consumers of inputs and services and these suppliers, thereby improving the productivity of both rice as a staple food crop and of cash crops. Increased sales of cash crops will provide the cash for sustained procurement of the technologies listed above and the relationships developed with input suppliers and service providers will foster the emergence of a commercial mindset amongst smallholder farmers. This will facilitate the development of commercial linkages with buyers, for example through outgrower schemes. Time-bound subsidies may be used to off-set the risk for both the private-sector firms and the farmers in developing new commercial relationships and experimenting with new production practices. Some of the more entrepreneurial and well-located farmers in this group may at some point “graduate” and become commercial rice producers that feed into a competitive rice value chain targeting urban markets.

**Recommendation #2: Invest in producers and areas important for “access to food.” Such investments will focus mainly on rain-fed rice produced by rural subsistence farmers who market surpluses to local markets. While these areas and producers are not competitive with imports, they are important to food security for some of the most vulnerable populations.**

### **3. REGIONAL RICE FOOD SECURITY STRATEGY—*DISTRIBUTION***

In an ideal world, regional self-sufficiency in rice production is not the best use of resources. However, given the risk of shocks leading to restrictions on exports by the leading producer nations, the growing disparity between production and consumption in West Africa and the declining rates of growth in production in Asia, significant investments to increase regional rice production certainly do make sense. Still, largely for political reasons, governments in the region are pursuing *national* self-sufficiency policies and programs, even though for some countries, this objective is probably unobtainable even in the long term. Only a few countries, such as Mali and Ghana, appear to have the potential to produce for export in the foreseeable future. This potential is determined by a number of factors such as agro-climatic conditions, a stable and well-developed enabling environment including service and input markets, channels demonstrating a drive to upgrade, production infrastructure including secure and transferrable land tenure, and so on. Components of a regional rice food security strategy can be grouped along two axes: trade facilitation and the sharing of learning experiences.

#### **a. Trade Facilitation**

Facilitating trade from those West African countries that in the future will be able to produce a surplus to countries that will remain critically dependent on imports of rice (e.g., rice exports from Mali to Côte d’Ivoire and Liberia), would have a positive effect on regional food security as it pertains to rice. Facilitating trade is likely to also reduce informal trade and lead to a better understanding of trade flows and thus of regional food security risks. Nevertheless, because of the focus on national food security, regional trade is unlikely to increase as a result of government policy in the short to medium term. Given the commitment of most governments to national food self-sufficiency, regional trade may be more likely to result from private-sector investments that generate surpluses that are cheaper than Asian imports while meeting consumer preferences. Once such surpluses are produced, an ECOWAS trade facilitation strategy will be essential. Most components of this trade-facilitation strategy are not rice-specific; they address food security in a broader context:

- Provide greater certainty regarding the price environment and create a less fragmented market by adopting a relatively low WAEMU CET. A large stable market is more likely to attract outside investment
- Remove or reduce tariffs and non-tariff trade barriers
- Harmonize taxation and facilitate its coordination among states
- Establish regional investment incentives
- Harmonize grades and standards
- Establish institutional mechanisms for regional finance
- Invest in and regulate ICT and information systems (for market prices, trade leads, new technologies, etc.)
- Facilitate and increase regional cooperation and coordination around i) agricultural research and development, ii) plant protection, iii) the coordination of river basin development and management, and iv) transportation investment and regulation

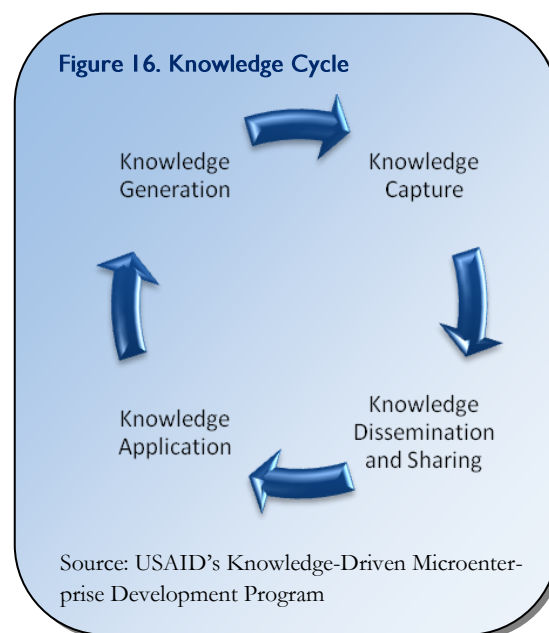
Some risks are associated with implementing regional strategies: i) there is the risk that an inherent need for unanimity will stifle progress and hold back development in the more progressive rice producing countries; and ii) there is a risk of imported rice pushing out local production. Facilitating rice trade within West Africa will initially benefit imported rice that is already flowing throughout the sub-continent. If successful in reducing tariffs, trade facilitation will bring

more competition to markets that currently derive some protection from trade barriers. A mitigating factor with regard to this second risk is that it will take time for regional trade facilitation interventions to become effective. By the time interventions start to actually improve trade flows (roughly a five-year horizon), commercial local rice production should have upgraded and grown to a level where it can compete with imports. The latter also depends on developments in the main rice producing and exporting countries of Asia.

## b. Sharing Learning Experiences

The recent rice crisis has created a strong momentum for the development of competitive rice value chains in most countries in West Africa. Subsidy programs in a number of countries have generated increases in production, which are unlikely to be sustainable over the long run. “Tangible” solutions to constraints, such as new technologies and business models, need to be coupled with practical strategies for addressing less tangible constraints such as misaligned incentives, uncompetitive firm-level behavior and donor dependency. The former without the latter is unlikely to be effective.

In order to speed the development of competitive rice value chains across West Africa, it will be critical to engage key actors in sharing new innovations, best practices and experiential knowledge about what works, what does not, and why. This will require a multi-faceted approach to capturing, sharing, disseminating and applying knowledge (figure 16). Guiding principles of this approach include recognizing that learning needs to be ongoing as conditions change, new approaches are developed and refined, and new actors enter the arena; that incentives to share knowledge need to be identified and aligned with efforts to promote knowledge sharing; that knowledge sharing fora require active, expert facilitation to elicit both explicit knowledge (codified best practices) and tacit knowledge (nuanced understanding of factors that qualify what is expressed in tacit knowledge); and that facilitators and participants need to create space for and protect dissenting opinions and insights.



One way to promote learning across a wide user-base is to create an interactive West Africa rice web-portal that links into experts and experiences from within and outside the region (e.g., IRRI, the University of Arkansas, etc.). The Africa Rice Center has started to develop such a portal and would be the logical organization to host it, but other organizations should play a critical supporting role. These include regional organizations such as CARD, CAADP and the Forum for Agricultural Research in Africa, international organizations such as FAO and WFP, and projects such as FEWS NET, E-ATP,<sup>166</sup> MARKETS<sup>167</sup> and PrOpCom<sup>168</sup> (Nigeria), and CDFO (Ghana).<sup>169</sup> The need for such a venue was highlighted during the three-day online consultation with a wide array of rice and value chain specialists that was held to inform and guide the preparation of this report (see annex III). The consultation underscored the value of engaging the right subject matter experts at the right time in the development of an initiative, through expert facilitation and focused on a specific set of objectives and opportunities. As such, it demonstrated the value of combining a knowledge-driven approach with effective technology to unite geographically dispersed actors to accomplish

<sup>166</sup> USAID’s Expanded Agribusiness and Trade Promotion project

<sup>167</sup> USAID’s Maximizing Agricultural Revenue and Key Enterprises in Targeted Sites project

<sup>168</sup> DFID’s Promoting Pro-Poor Opportunities Through Commodity and Service Markets project

<sup>169</sup> MCC’s Commercial Development of Farmer-Based Organizations



a shared task. These principles should be brought to bear to ensure maximum impact of efforts to strengthen West African rice value chains.

**Recommendation #3: Invest in distribution, improved regional trade and information sharing to facilitate rice flows and learning throughout the region. This facilitation will initially increase flows for imported rice and thus create a more competitive environment for local rice. However, regional trade improvements will eventually be needed to exploit competitive advantages within West Africa. Region-wide learning will ensure that lessons in one country are shared elsewhere.**

## **C. SUSTAINABILITY OF THE STRATEGY**

To ensure the sustainability of the food security strategy articulated above, attention needs to be paid to the systemic constraints that underlie the current state of the rice value chain across West Africa. Governments in most countries in the region have launched subsidy programs of one kind or another to bolster food security. These programs are reminiscent of pre-structural adjustment programs in which government investment plays a major role. Such strategies, however, have to date failed to generate the increases in quality and volume needed to replace Asian imports or to achieve national food self-sufficiency. Given the stretched resources in most of these countries, governments are unlikely to be able to subsidize the investments needed to achieve food security goals.

Despite this reality, governments and farmers alike have a deeply ingrained mistrust of markets and the private sector. Liberalization did not change this mindset, which has continued to undermine market- and private sector-led strategies. Addressing this issue will not be easy, but a first step is recognizing its prevalence and importance.

At the same time, governments in the region are signing CAADP compacts that call for regional trade. This report suggests a strategy that relies on improved trade between areas of regional surplus and regional deficit. To obtain buy-in to this approach, negotiations will be needed that confront the dissonance between CAADP compacts that include regional trade and national self-sufficiency programs and strategies. Unless there is real agreement on these issues, which may take considerable time, meaningful advances in regional food security may be hampered.



# ANNEX I. SUPPLEMENTARY TABLES

Table I. Calories Sources, 2003-05 (Kcal per Person per Day)

Country	Rice	Wheat	Corn	Other	Cassava	Total
Benin	242	27	475	150	374	2,293
Burkina Faso	167	41	403	1,289	1	2,620
Cameroon	193	127	313	220	271	2,233
Chad	71	44	94	842	90	1,980
Côte d'Ivoire	428	128	181	31	313	2,518
The Gambia	306	183	67	565	14	2,135
Ghana	215	112	355	121	613	2,687
Guinea	918	104	88	96	293	2,538
Guinea Bissau	773	96	163	202	73	2,054
Liberia	508	262	33	0	440	2,008
Mali	525	74	249	881	8	2,566
Mauritania	305	841	26	131	0	2,785
Niger	193	40	34	1,143	29	2,137
Nigeria	226	119	192	619	242	2,603
Senegal	677	207	185	264	51	2,154
Sierra Leone	762	128	26	46	173	1,912
Togo	212	90	481	196	305	2,018

Source: Calculated from data given in FAOSTAT. Grain consumption excludes grain consumed in the form of beer.

Table 2. Rice and Rice Product Per Capita Consumption (Kg per Year), 1961-2006

Country	Yearly Average					
	1961-1970	1971-1980	1981-1990	1991-2000	2001-2005	2006 (est.)
Benin	2.37	4.06	10.71	15.67	31.62	45.70
Burkina Faso	4.70	5.32	11.78	15.10	12.99	10.86
Cameroon	2.44	5.09	8.49	7.23	12.29	15.75
Chad	5.40	5.57	6.27	8.78	7.32	6.87
Côte d'Ivoire	38.74	46.21	64.97	43.04	59.53	61.43
The Gambia	68.14	67.31	79.65	46.21	27.42	24.44
Ghana	7.19	7.24	7.87	11.45	26.97	31.70
Guinea	47.49	54.20	58.53	70.25	69.57	69.57
G. Bissau	65.73	71.82	92.10	70.92	57.45	55.20
Liberia	93.97	113.61	118.04	58.20	50.46	45.69

Mali	18.36	20.85	22.71	32.08	39.65	41.65
Mauritania	10.28	22.76	46.01	49.57	20.23	22.30
Niger	3.59	5.46	10.38	7.17	3.54	2.31
Nigeria	2.76	7.08	15.81	20.27	24.44	25.38
Senegal	54.59	55.01	66.73	63.73	72.54	68.81
Sierra Leone	89.73	105.11	95.43	93.57	81.35	80.51
Togo	7.87	6.34	13.69	25.25	15.51	13.79
<b>West Africa</b>	<b>13.07</b>	<b>17.02</b>	<b>24.34</b>	<b>25.68</b>	<b>18.33</b>	<b>18.80</b>

Source: WARDA. 2007 *Africa Rice Trends*. 58

**Table 3. Self-Sufficiency Ratio by Decade**

Country	1980s	1990s	2001-2005
Benin	0.13	0.18	0.23
Burkina Faso	0.33	0.32	0.36
Cameroon	0.57	0.29	0.19
Chad	0.71	1.04	1.18
Côte d'Ivoire	0.54	0.74	0.42
The Gambia	0.30	0.27	0.39
Ghana	0.47	0.61	0.33
Guinea	1.39	1.23	1.28
Guinea Bissau	0.84	0.90	0.66
Liberia	0.74	0.64	0.45
Mali	0.82	1.13	0.80
Mauritania	0.27	0.38	0.67
Niger	0.55	0.65	1.10
Nigeria <sup>a</sup>	0.87	0.93	0.64
Senegal	0.22	0.20	0.18
Sierra Leone	0.96	0.65	0.79
Togo	0.37	0.39	0.48
<b>West Africa</b>	<b>0.71</b>	<b>0.76</b>	<b>0.58</b>

Source: WARDA. 2007 *Africa Rice Trends*.12

<sup>a</sup> The Nigerian entries likely understate the actual self-sufficiency rate given the amount of smuggling, especially in the most recent period.

Table 4. Percentage of the Population Living below the Poverty Line in West Africa

Country	Using National Poverty Line <sup>a</sup>			Using International Poverty Line <sup>b</sup>	
	Rural	Urban	Total	US \$1.25/day	Us \$2/day
Benin	46.0	29.0	39.0	47.3	75.3
Burkina Faso	53.4	19.2	46.4	56.5	81.2
Cameroon	49.9	22.1	40.2	32.8	57.7
Chad	48.6	..	43.4	61.9	83.3
Côte d'Ivoire	..	..	..	23.3	46.8
The Gambia	63.0	57.0	61.3	34.3	56.7
Ghana	39.2	10.8	28.5	30.0	53.6
Guinea	..	..	40.0	70.1	87.3
Guinea Bissau	..	52.6	65.7	48.8	77.9
Liberia	..	..	..	83.7	94.8
Mali	75.9	30.1	63.8	51.4	77.1
Mauritania	61.2	25.4	46.3	21.2	44.1
Niger	66.0	52.0	63.0	65.9	85.6
Nigeria	36.4	30.4	34.1	64.4	83.9
Senegal	40.4	23.7	33.4	33.5	60.3
Sierra Leone	79.0	56.4	70.2	53.4	76.1
Togo	..	..	32.3	38.7	69.3
<b>Total</b>	..	..	..	53.8	75.4

Source: WARDA. 2007 *Africa Rice Trends*.12

<sup>a</sup> Data are for various years in the 1990s and 2000s and reflect varying definitions of the poverty line.

<sup>b</sup> Data are for recent years ranging from 2002 to 2007 (except for the Côte d'Ivoire data, which are for 1996).

Table 5. Ghana Rice Imports, 2003-06

	Volume (MT)	Value (US \$000)
<b>Total Rice Imports</b>		
2003	755,039	117,291
2004	711,344	185,191
2005	393,200	129,703
2006	389,660	118,236
<b>Rice Imports by Type, 2006</b>		
Paddy	191	135
Brown	7	5
Milled	35,007	16,197
Broken <sup>a</sup>	354,455	101,899
<b>Major Suppliers, 2006</b>		
Thailand	137,198	44,978
Vietnam	121,150	31,183

USA	85,528	28,356
Pakistan	11,947	4,550
India	11,698	3,033
Togo	11,000	2,583
UAE	3,055	1,527

Source: World Bank, *Poverty Data. A Supplement to World Development Indicators*, 2008

<sup>a</sup> According to correspondence with Tom Slayton, the percentage of broken is lower than claimed in this dataset.

**Table 6: Liberia Rice Imports, 2001-07**

	Volume (MT)	Value (US \$000)
<b>Total Rice Imports</b>		
2001	95,533	16,456
2002	68,418	12,131
2003	580	9,819
2004	179,175	35,135
2005	770	36,985
2006	207,579	50,223
2007	148,763	35,518
<b>Rice Imports by Type, 2007</b>		
Paddy	1	1
Brown	3,004	1,277
Milled	145,723	34,228
Broken	35	12
<b>Major Suppliers, 2007</b>		
China	135,081	30,217
USA	13,282	5,080

Source: International Trade Center (ITC) calculations based on UN COMTRADE data; accessed using ITC's TradeMap ([www.trademap.org](http://www.trademap.org))

**Table 7: Mali Rice Imports, 2001-07**

	Volume (MT)	Value (US \$000)
<b>Total Rice Imports</b>		
2001	82,763	14,639
2002	202,814	33,237
2003	186,675	38,532
2004	105,389	21,076
2005	272,371	60,071
2006	180,207	45,549
2007	187,142	39,856

<b>Rice Imports by Type, 2007</b>		
Paddy	10	23
Brown	176	22
Milled	61,491	15,149
Broken	75,465	24,662
<b>Major Suppliers, 2007</b>		
Côte d'Ivoire	35,370	11,592
India	34,355	8,017
Pakistan	22,142	6,085
Thailand	16,327	6,085
Senegal	10,900	2,488
Vietnam	9,622	2,647
Japan	5,995	4,118

*Source:* International Trade Center (ITC) calculations based on UN COMTRADE data; accessed using ITC's TradeMap ([www.trademap.org](http://www.trademap.org))

**Table 8: Nigeria Rice Imports, 2001-06**

	<b>Volume (MT)</b>	<b>Value (US \$000)</b>
<b>Total Rice Imports</b>		
2001	1,100,032	196,682
2002	1,232,795	233,991
2003	2,456,566	230,271
2004	0	0
2005	0	0
2006	2,551,809	423,567
<b>Rice Imports by Type, 2006</b>		
Paddy	20	11
Brown	30,325	7,096
Milled	2,424,524	370,699
Broken	96,940	45,761
<b>Major Suppliers, 2006</b>		
Thailand	1,705,355	126,455
India	316,627	118,352
USA	257,215	89,906
UAE	142,443	39,877
Philippines	36,705	13,450
UK	36,572	3,657
France	24,088	8,110

*Source:* International Trade Center (ITC) calculations based on UN COMTRADE data; accessed using ITC's TradeMap ([www.trademap.org](http://www.trademap.org))

Table 9: Senegal Rice Imports, 2001-07

	Volume (MT)	Value (US \$000)
<b>Total Rice Imports</b>		
2001	682,078	142,137
2002	856,269	184,446
2003	890,044	217,849
2004	822,545	242,400
2005	1,251,540	308,595
2006	705,887	209,270
2007	1,056,432	363,904
<b>Rice Imports by Type, 2007</b>		
Paddy	1,570	1,029
Brown	6	7
Milled	36,127	12,126
Broken	1,018,729	350,742
<b>Major Suppliers, 2007</b>		
Thailand	555,774	197,514
India	305,128	101,599
Brazil	70,753	23,109
Egypt	42,261	13,768
Vietnam	30,766	10,389
Uruguay	24,513	8,100
Argentina	13,695	4,402

Source: International Trade Center (ITC) calculations based on UN COMTRADE data; accessed using ITC's TradeMap ([www.trademap.org](http://www.trademap.org))

Table 10. Rice Shipped as Food Aid to West Africa, 2004-2007 (MT)

Country	2004	2005	2006	2007
Benin	16,649	9,390	6,062	140
Burkina Faso	16,029	17,430	12,422	12,709
Cameroon	28,166	11,120	6,085	575
Chad	4,316	5,215	1,573	1,000
Côte d'Ivoire	13,677	20,013	9,862	13,071
The Gambia	2,898	8,207	11,328	7,036
Ghana	6,799	1,200	475	375
Guinea	10,869	11,421	13,973	11,357
Guinea Bissau	2,273	7,413	4,316	5,539
Liberia	3,522	33,137	3,487	3,439
Mali	0	12,735	11,182	0
Mauritania	19,576	16,107	12,045	10,416
Niger	15,691	60,648	25,511	22,356



Nigeria	0	10,500	0	0
Senegal	14,807	21,886	8,517	18,837
Sierra Leone	6,181	7,676	7,799	9,060
Togo	0	0	0	10
<b>West Africa</b>	<b>161,153</b>	<b>254,098</b>	<b>134,637</b>	<b>115,920</b>

Source: World Food Programme Quantity Reporting. <http://www.wfp.org/fais/quantity-reporting>

**Table 11. West African Consumer Preferences for Rice**

Country	Rice Market Characteristics
Benin	<ul style="list-style-type: none"> <li>Primarily and importer of high quality white rice, but also buys fragrant rice and some 25 percent broken. High quality white and perfumed rice is preferred in urban areas.</li> <li>Some consumers also prefer parboiled rice, especially in rural areas.</li> </ul>
Burkina Faso	<ul style="list-style-type: none"> <li>Consumer preference is mostly for 25 percent broken rice. Rice is not an essential staple food, but it is becoming more popular. Rice is mostly consumed in urban areas, whereas rural populations consume local cereals, millet and sorghum and fonio, in addition to rice.</li> <li>Though local rice is currently cheaper than imported rice, urban consumers prefer imported rice. Local rice is believed to be of good quality, but harder to access in urban areas than imported rice.</li> </ul>
Cameroon	<ul style="list-style-type: none"> <li>Imports 25 percent broken rice, but also significant quantities of high quality white rice.</li> </ul>
Chad	<ul style="list-style-type: none"> <li>Market for 25 percent broken.</li> </ul>
Côte d'Ivoire	<ul style="list-style-type: none"> <li>Imports a broad range of qualities, including significant tonnages of fragrant whole grain, high quality white rice, 25 percent, and fragrant broken.</li> <li>The overall market is dominated by 25 percent broken white rice, followed by high quality white rice, fragrant broken, and perfumed 100 percent whole grain rice (an emerging category).</li> <li>Imported 25 percent broken rice is mostly sold on rural markets. In urban areas the preference is for white long-grain 100 percent whole grain rice, including perfumed rice.</li> <li>Local rice is mostly consumed in rural areas.</li> </ul>
The Gambia	<ul style="list-style-type: none"> <li>Price conscious market, imports 25 percent white broken.</li> </ul>
Ghana	<ul style="list-style-type: none"> <li>Rice is not an essential staple food. Consumer preference is for high quality white and fragrant rice. Perfumed rice is sold at a premium and Ghana is Africa's largest importer of fragrant rice. Not insignificant tonnages of fragrant broken are imported, also.</li> <li>In north, consumers used to prefer parboiled rice until a few years ago; currently they prefer white rice.</li> <li>Local rice is sold cheaper than the cheapest imported rice.</li> </ul>
Guinea	<ul style="list-style-type: none"> <li>Imports are mostly low quality 25 percent broken. Rural consumers prefer locally parboiled rice.</li> <li>Some varieties of local rice are popular and sold at a premium to imported rice.</li> </ul>
Guinea Bissau	<ul style="list-style-type: none"> <li>Rice is the key staple food, but consumers readily switch between local and imported rice.</li> </ul>
Liberia	<ul style="list-style-type: none"> <li>Consumer preference is for round grain Chinese rice and low quality parboiled rice.</li> </ul>
Mali	<ul style="list-style-type: none"> <li>Consumer preference is mostly for 25 percent broken rice, but imports also include broken – both white and fragrant.</li> </ul>

	<ul style="list-style-type: none"> <li>• Rice is not a key staple food, but it is becoming more popular.</li> <li>• Some varieties of local rice are popular and sold at a premium to imported rice.</li> </ul>
Mauritania	<ul style="list-style-type: none"> <li>• Consumer preference is for 100 percent broken rice – both fragrant and white.</li> </ul>
Niger	<ul style="list-style-type: none"> <li>• Consumer preference is for white 25 percent broken and for locally parboiled rice. Market is split equally between these two types of rice.</li> </ul>
Nigeria	<ul style="list-style-type: none"> <li>• In northern Nigeria the preference is for rice flour (97 percent share), as opposed to grain. In south, the preference is for high quality parboiled, mostly imported rice.</li> </ul>
Senegal	<ul style="list-style-type: none"> <li>• Consumer preference for 100 percent broken rice – both white and fragrant.</li> <li>• Rice is a staple food.</li> <li>• In rice production areas local rice is preferred. In urban areas consumer prefer imported rice, especially fragrant broken.</li> </ul>
Sierra Leone	<ul style="list-style-type: none"> <li>• Price conscious market, imports 25 percent and white broken.</li> </ul>
Togo	<ul style="list-style-type: none"> <li>• Primarily imports high quality rice, both white rice and fragrant, but also 25 percent broken.</li> </ul>

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# ANNEX III. WEST AFRICA RICE E-CONSULTATION

## A. INTRODUCTION

From August 25-27, 2009, an online forum was held with invited rice specialists from eight African countries, the US and Europe. The forum discussed the opportunities and constraints for increasing the competitiveness of rice value chains in West Africa and their contribution to food security in the region, drawing on the preliminary findings of this report. Each day, participants were invited to share their own experiences, questions and comments on the following topics:

- *Day One:* What was the impact of the “rice crisis” in West Africa?
- *Day Two:* What is needed to increase the competitiveness of domestic rice production in West Africa?
- *Day Three:* What are the components of an overall strategy for increasing competitiveness, improving food security, and reducing poverty in West Africa through the rice value chain?

## B. PARTICIPANTS

The 30 active participants in the e-consultation were as follows:

Ibrahima Bamba Africa Rice Center Benin	Amadou Camara MCC Mali	Ruth Campbell ACDI/VOCA USA
Nango Dembélé Michigan State University USA	Matty Demont Africa Rice Center Senegal	Jeanne Downing USAID USA
Michael Field ACDI/VOCA Liberia	William Grant DAI USA	Hiroshi Hiraoka CARD Secretariat Kenya
Don Humpal DAI USA	Samina Jain Independent consultant USA	Carlton Jones JE Austin Associates USA
Patrick Kormawa UNIDO Austria	Olaf Kula ACDI/VOCA Ghana	Tom Lenaghan DAI USA
David Neven DAI USA	Roland Oroh Rossland Consulting Limited Nigeria	Julian Peach DFID-PrOpCom Nigeria
Tom Remington Catholic Relief Services Burkina Faso	Christopher Reynolds DAI USA	Brent Simpson Michigan State University USA

Tom Slayton  
Independent consultant  
USA

Don Snodgrass  
Independent consultant  
USA

John Staatz  
Michigan State University  
USA

Dirck Stryker  
AIRD  
USA

David Sturza  
EcoVentures International  
USA

Greg Vaut  
ARD, Inc.  
USA

Jason Wares  
RTI International  
USA

Jason Wolfe  
USAID  
USA

## C. SUMMARY OF PROCEEDINGS

### KEY POINTS FROM DAY I

- In an ideal world, regional self-sufficiency in rice production is not the best use of resources, but given the risk of shocks leading to restrictions on exports by the leading producer nations, coupled with the growing disparity between supply and demand in West Africa, investments to increase domestic production certainly do make sense. Regional food security in this context will require a commitment from governments to facilitate regional trade.
- Rice can be produced competitively in West Africa in the context of the new global market environment in which higher rice prices are likely to remain in place due to the underlying current of population and income growth, urbanization and fast growing demands pulls on grains (food, feed, fuel, fiber). Higher prices are present in the urban markets and will only be felt by producers if they can sell in these urban markets. The potential to improve yields and efficiencies in the value chain in general are very high in West Africa and further underline the competitive potential.
- Large donor and government support programs have consistently failed in the past. Often, the number one constraint is the government itself, which fails to create the appropriate institutional environment for the economic development of the rice sector (relax constraints, facilitate).
- Different development and investment strategies are needed to tackle distinct objectives:
  - i. an incremental development approach to improve the food security of the large group of subsistence rice farmers (impact on food security and poverty in rural areas); and
  - ii. a great leap forward development approach targeting the smaller group of market-oriented rice farmers that can add large volumes of rice into the commercial rice value chain (impact on urban food security, and indirect impact on rural food security through job creation).
- Key elements to developing commercial value chains for domestic rice are:
  - i. achieving the quality that is needed in the different market segments (which to a large degree is a question of improved milling)
  - ii. a transformation of land tenure systems so that private investments are made in irrigation infrastructure which are key for commercial rice production
  - iii. an introduction of rice varieties with new genetics that can grow in poor soils
  - iv. attracting investment from larger firms that can direct the supply chain (e.g., importers shifting to making investments in milling)
  - v. removing the impediments to business to allow the existing and sufficiently large base of experienced rice farmers to drive supply growth

## KEY POINTS FROM DAY 2

- The operational environment has fundamentally changed: climate change is projected to cause a 15 percent decline in agricultural productivity in West Africa over the next 50 years (50 percent in the Sahel). Fuel prices are rising as demand keeps growing and supply from the main oil fields is decreasing. Any growth in the use of food stock to produce fuel stocks will also drive prices higher. The net effect will be higher fertilizer prices, higher transportation costs and high costs of moving water in areas such as in the Senegal River Valley.
- One of the most important prerequisites for developing a viable strategy for rice in West Africa will be to bring the private sector—local and foreign, large and small—into the discussion and empowering it to play a meaningful role in both designing and implementing the strategy. Governments (local or foreign) are not competent solvers of problems like this. The Olam/MARKETS example is highly relevant in this context. Investment can come from unexpected corners (such as Thai exporters).
- Governments need to play a facilitating role, i.e.:
  - i. Transparent, consistent policies need to be in place (stable policy environment)
  - ii. Up-to-date, reliable statistics on the rice sector need to be made available, as well as effectiveness assessments of existing government institutions and policies, in order to provide a sound basis for the development of national rice development plans.
  - iii. Governments should not be directly involved in development of the industry, but should facilitate private sector development.
  - iv. A shift to private land tenure is critical to the development of irrigated rice production, which is in turn critical to developing a rice value chain in West Africa that can compete with imported rice.
- Stakeholders know what is needed to increase productivity, but this needs to be linked to market demand.
- Investments are needed to raise the volume and quality of West African rice production to compete with imports in the medium to long term. These include private investment, government investments for essential infrastructure (irrigation, roads, electricity, viable seed systems, etc.) and donor investments to facilitate emergence of institutions to support market-led, pro-poor development (efficiency and political power/voice) of the rice value chain for sustainability. All these three should be coordinated. Key issues in this context are:
  - i. Who should take up the role of national and regional value chain coordination?
  - ii. Attracting investment is going to take serious progress on lowering transaction costs (roads and other infrastructure, government barriers, etc.) and the removal of policy and non-market economic disincentives.
  - iii. To avoid the mistakes of the past, investments should build on existing models that work to some degree and remove bottlenecks.
- It is hard to generalize across countries; each is unique. The structure of the individual markets (size, market segmentation, spending power) will make a big difference in the nature of a feasible response. At the same time, the nature of the existing supporting infrastructure is critical to determining the type of systemic supply response that can be generated (e.g., Mali far outstrips Nigeria in terms of functioning systems, largely due to good government policies).

## KEY POINTS FROM DAY 3

- Achieving **quality** is a key challenge. Opportunities exist in the form of improving processing methods (e.g., for parboiling in Benin) and for adding sorting and branding (e.g., Rival rice in Senegal). These are two examples that show that improved quality can lead to a willingness on the part of the consumer to pay a premium (of around CFA50/kg in these cases). The Rival case, where sorting is done manually, indicates that hard technology may not

be necessary in the short run (if wages are low). In the long run though, upgrading in processing technology is required to achieve quality more efficiently and on a larger scale.

- Different **value chain structures** can be the recommended, depending on the specific nature of the business environment. Cluster development may be an option around irrigated rice production areas where large volumes of rice are concentrated. Directed value chains, such as the one being developed by Olam in Nigeria, may offer opportunities where large markets justify big investments in milling. However, directed value chains also hold the risk of the lead firm forcing low paddy rice prices upon farmers. These new Nigerian directed value chains may at this point also not be sustainable in the absence of donor funding. In Mali, improvements in value chain development were achieved without the presence of a lead firm (as more balanced value chains).
- At the **regional level**, intervention opportunities focus on policy and the regulatory environment. In collaboration with ECOWAS, these interventions could focus on: tariffs and non-tariff trade barriers, taxation and its coordination among states, facilitation of intra-regional trade and transportation, the establishment of regional investment incentives, harmonized grades and standards, the establishment of institutional mechanisms for regional finance, regional cooperation in agricultural research and development, regional plant protection, regional coordination of river basin development and management, regional coordination of transportation investment and regulation, and regional coordination of investment in and regulation of information and communications technology and market information systems. However, regional policies require the same level of commitment by all states, which may be difficult to achieve, making country-specific policies perhaps more effective. Also, some countries are more likely to become competitive rice producers and regional exporters.
- Support to improve **production** should include large investments in irrigation infrastructure (by governments) as well as the introduction of new technologies for rain-fed production. Irrigation schemes are resource demanding, but if well done, they are the most efficient way to producing the large volumes needed in commercial rice value chains. Readily available technologies that would put rain-fed production on an incremental growth path to commercialization if introduced to smallholder producers include: new seed varieties such as NERICA (supplied by new or improved seed companies); increased use of nitrogen fertilizer (urea); local oxen with modified local plowing equipment; improved water control systems that use the landscape's existing hydrology; transplanting and threshing technologies (small mechanization equipment currently available from countries such as South Korea). A removal of regulatory constraints can also play a facilitating role.
- **Finance** is a key issue and several support program elements were discussed.
  - i. Incremental technology improvements can be financed through group saving and lending schemes (a case study from Sierra Leone was mentioned).
  - ii. Programs can work with banks to lend to women processors (e.g., parboiling in Nigeria). This could allow them to use processors as service providers rather than sell to them, thus allowing the women to capture a greater value added.
  - iii. Public investment is the only option for the primary components of large irrigation infrastructure. At the same time, finance products must be developed with banks to provide the capital to farmers to maintain the secondary and tertiary irrigation systems.
  - iv. Financial products or business models need to be developed to assist farmers with the marketing of their rice. Farmers sell their rice over time in small lots in order to manage their household cash flows, thus increasing transaction costs in the system. Solving this requires a combination of improvements in storage, standardization, grading and certification, collateralization of stocks, and market information systems as a new service provision (simplified warehouse receipt system).

- v. Input purchase financing can be done through outgrower contracts that involve an input supplier, a buyer and a financial institution (the case of Notore in Nigeria was mentioned, which also included agronomic advice provided by the input supplier as an embedded service).
- **Constraints in processing** were discussed, including access to large quantities of low-cost rough rice (so production-side improvements would automatically help processing-side improvements); upgrading equipment that improves quality and which requires investment loan products (demonstration and replication approaches may work here); and providing working capital loan products for processors so that they can buy paddy and hold stocks at optimal levels.
- **Other issues** discussed included:
  - a. The importance of taking civil society and communities into account and making them an intrinsic part of public-private-partnerships. It is important to understand the relationship between business growth and network strength and communicate this to the social networks.
  - b. Constraints should not be fixed by a support program, but rather programs should facilitate private-sector initiatives to remove constraints. Subsidies should be used judiciously in order to avoid market distortions.
  - c. Any productivity improvements, especially at the more competitive production level where market power is low, will only lead to temporary increases in profitability. Prices will adjust downward to the benefit of larger stakeholders farther downstream or consumers. Seeking improvements in efficiency and finding ways of balancing power along the value chain should become part of the business model (win-win solutions).

A full transcript of the online discussion can be found at:

[http://www.microlinks.org/ev.php?ID=41045\\_201&ID2=DO\\_TOPIC](http://www.microlinks.org/ev.php?ID=41045_201&ID2=DO_TOPIC)