ATTACHMENT IV

TO THE

GLOBAL FOOD SECURITY RESPONSE WEST AFRICA RICE VALUE CHAIN ANALYSIS

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GLOBAL FOOD SECURITY RESPONSE NIGERIA RICE STUDY

microREPORT #159

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ACRONYMS

ADPs	Agricultural Development Programs
CBN	Central Bank of Nigeria
CCP	Crop Control and Protection
FGN	Federal Government of Nigeria
FMAWR	Federal Ministry of Agriculture and Water Resources
GDP	Gross Domestic Product
GEMS	Growth in Employment in States
Ha	Hectare
ICT	Information and Communications Technology
IFDC	International Fertilizer Development Corporation
IFPRI	International Food Policy Research Institute
MT	Metric Ton
N	Nigerian Naira
NCRI	National Cereals Research Institute
NCS	National Customs Service
NEMA	National Emergency Marketing Agency
NERICA	New Rice for Africa
NESG	National Economic Summit Group
NGO	Non-governmental organization
NPFS	National Program for Food Security
NRDS	National Rice Development Strategy
POP	Package of Practices
SME	Small and Medium-Sized Enterprise
THA	Tractor Hire Agency
UK-DFID	United Kingdom Department for International Development
USAID	United States Agency for International Development
USDA	United States Department of Agriculture
WARDA	West African Rice Development Association

GLOSSARY

Facilitator/facilitation: An action or individual (or group of individuals) that temporarily works to develop more inclusive, dynamic and differentiated markets without becoming a part of the markets.

Food security: Food security exists when all people, at all times, have physical and economic access to sufficiently safe and nutritious food that meets their dietary needs and food preferences for an active and healthy lifestyle.

Lead firms: Businesses capable of exerting a leading influence on other firms and other players, because of factors such as their size or their reputation for innovation.

Market: A set of arrangements by which buyers and sellers are in contact to exchange goods or services; the interaction of demand and supply.

Market system: The multi-player, multi-function arrangement comprising three main sets of functions (core, rules and supporting) undertaken by different players (private sector, government, representative organizations, civil society, etc.) through which exchange takes place, develops, adapts and grows. A construct through which both conventionally defined markets and basic services can be viewed.

Point of order: A physical location where orders can be made for specific products or services.

Transaction costs: The costs associated with the basic process of exchange including costs concerned with searching, screening, negotiating, contracting, monitoring and enforcing transactions.

Upgrading: Upgrading is the process by which business owners innovate to add value to products or services and to make production and marketing processes more efficient in order to respond effectively to market opportunities.

Value Chain Governance: The relationships among the buyers, sellers, service providers and regulatory institutions that operate within or influence the range of activities required to bring a product or service from inception to its end use.

Value Chain Governance—Arm's Length Typology: Involves transactions that are relatively simple, information on product specifications is easily transmitted, and producers can make products with minimal input from buyers.

Value Chain Governance—Balanced Typology: When interactions between buyers and sellers are characterized by the transfer of information and embedded services based on mutual reliance regulated through reputation, social and spatial proximity, family and ethnic ties and the like.

Value Chain Governance—Directed Typology: When small suppliers are dependent on a few buyers that often wield a great deal of power and control. Such networks are frequently characterized by a high degree of monitoring and control by the lead firm.

Value Proposition: A business or marketing statement that summarizes why a consumer should buy a product or use a service. This statement should convince a potential consumer that one particular product or service will add more value or better solve a problem than alternative options.

EXECUTIVE SUMMARY

Rice is an extremely important food and cash crop in Nigeria. With total annual rice production at about 2 million metric tons (MT), it is the fourth largest cereal crop grown in the country behind sorghum, millet and maize. However, since Nigeria also imports about 2.5-3 million MT of rice, total national consumption exceeds 5 million MT per year, or more than 30 kg per capita per annum. Rice is rapidly becoming the preferred staple food in the urban areas, where annual consumption exceeds 47 kg/capita. Farmers sell 80 percent of the rice they produce, making it a very important source of income for smallholder producers, complementing other agricultural production. Considering that total sales of rice exceed $5 billion per year, $3 billion of which are from imports, there is a significant rice market in Nigeria.

Nigerian government policy heavily protects rice in order to stimulate import substitution. The Federal Government of Nigeria (FGN) has either banned imports or placed very high duties (over 100 percent) on imported rice over much of the last decade. With the recent food crisis and tripling of the global price of rice in 2008, the FGN did cancel the duty for 6 months, but has since raised it back to 32.5 percent. In addition to the tariff protection, the FGN heavily subsidizes many of the inputs into the rice industry, including fertilizers and mechanization services, as well as credit. Unfortunately, aside from raising the cost of rice on the domestic market, there has not been a strong supply-side response to this favorable environment. This lack of response stems largely from three sources: (1) the urban consumer preference for the higher-quality imported rice (well cleaned, polished and color-sorted) over domestic rice, which contains a high volume of stones; (2) the highly fragmented and poorly serviced domestic rice value chain, which provides few incentives for upgrading; and (3) the erratic FGN policy environment, which creates disincentives for the necessary private-sector investment in key functions of the rice value chain, primarily processing and input supply.

The value chain for domestically produced rice is currently dominated by a largely fragmented production and milling industry, with limited new investment in either production or processing. While the returns are quite high at each stage of the traditional value chain channel, there are so many participants in the channel that the benefits are spread very thin, and few have any incentive to invest. With very high prices, a protected market and ever-increasing imports, the potential is high to promote a strong supply response under the right conditions. Some new investments in heavier milling capacity in new channels (i.e., Olam and Veetee private-sector mills) offer good private-sector driven models that can compete with imports for the high-end urban market, offer lower prices to consumers, yield high profit margins to both the producers and the millers and contribute to a more efficient value chain overall that improves food security in Nigeria. The major constraint is the lack of a consistent, reliable supply of high-grade paddy to the mills, and therefore the establishment of viable large mills requires investment in developing a reliable supply.

Given the massive gap between the quality of domestic rice production and imports, and the nascent stage of the new channels feeding the urban market, a realistic target for domestic production of high-quality rice to substitute imports might be one million MT. It will most likely take over ten years to generate one million MT of additional rice production, thus any strategy must have a long-term vision.

Successfully achieving this vision for the rice value chain will require four elements to come together, three of them driven by the private sector and one driven by FGN, state and local governments:

- Continued private-sector investment in large-scale milling operations that are able to produce rice that can compete with imports on quality and price—this will require investment in 50 new mills.
- An efficient, dynamic, and commercially oriented set of rice value chain support services and product providers, including agro-input supply, farm mechanization services, finance, extension services and marketing services.

- More dynamic rice paddy producers who are incentivized to invest in improved productivity and expanding production and are tied into the large-scale milling industry.
- A more conducive business enabling environment marked by supportive policies, laws and regulations that are formulated in a participatory manner, with private-sector input. Policies, laws and regulations need to be managed in coordination with state and local governments, and monitored and evaluated to measure impact.

If these elements can come together properly to yield one million MT of less expensive, high-quality rice for the urban markets, there will also be important productivity spin-offs in all channels of the value chain. These will lead to lower costs of production of rice in general, and lower costs to the consumers, in turn increasing food security for Nigeria.

I. INTRODUCTION TO THE RICE INDUSTRY IN NIGERIA

As the most populous country in Africa, Nigeria is the continent's leading consumer of rice. It is one of the largest producers of rice in Africa and simultaneously one of the largest rice importers in the world. Rice is consumed regularly in Nigeria's urban and rural areas and is an important food security crop. It is, however, primarily a cash crop for those farmers who produce it (selling nearly 80 percent of total production and directly consuming only 20 percent), and it generates more income for Nigerian farmers than any other cash crop in the country.[1] The total industry, between imports and domestic production, is valued at about $5 billion, with nearly $4 billion accruing inside Nigeria.

Estimates indicate that over 90 percent of domestic rice production comes from resource-poor and weakly organized smallholders,[2] a key fact when considering the wide-ranging constraints that continue to impede significant progress in Nigeria's farm-level productivity and international competitiveness in rice. More than half of all Nigerians live on less than 1 dollar per day, and the poverty incidence exceeds 60 percent in rural areas,[3] where people overwhelmingly depend on agricultural activities for their livelihoods. Consequently, agricultural incentives that elevate production capacity are of the utmost importance for fostering broad-based economic growth, poverty reduction and improved food security.[4]

The data on Nigeria's rice value chain varies greatly depending on the source. The following information constitutes best estimates for key rice value chain metrics:

- In 2008, Nigeria produced approximately 2 million MT of milled rice[5] and imported roughly 3 million MT, including the estimated 800,000 MT that is suspected to enter the country illegally on an annual basis.[6] Notably, even though Nigeria's rice trade policy has been and continues to be heavily protectionist, ranging from outright import bans in the 1980s to the 32.5 percent tariff/levy combination that is applied to rice imports currently, it has had little effect in stimulating local production to a level of significant import substitution.

- Rice is produced in at least 35 of Nigeria's 37 States,[7] covering three major ecological zones: rain-fed upland, rain-fed lowland and irrigated. Production in the rain-fed upland system is largely subsistence-based, while production in the rain-fed lowland and irrigated systems is commercially oriented.

- In 2007, the paddy production of 6 states constituted more than 60 percent of total domestic output: Niger (452,000 MT), Kaduna (347,000 MT), Benue (296,000 MT), Taraba (282,000 MT), Ebonyi (256,000 MT), and Kwara (234,000 MT).[8]

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[1] Lancon et al. "Imported Rice Retailing and Purchasing in Nigeria: A Survey."

[2] Nigeria Federal Ministry of Agriculture and Water Resources. "Agricultural Production Survey."

[3] Nigeria National Bureau of Statistics. "National Living Standard Survey."

[4] Walkenhorst. "Distortions to Agricultural Incentives in Nigeria."

[5] This is based on rice paddy production of approximately 3.4 million MT and an estimated paddy to rice conversion rate of 60 percent. This rate is based on conversion rates communicated by key stakeholders in Nigeria's rice industry.

[6] USDA Foreign Agricultural Service GAIN Report. "Nigeria Grain and Feed Rice Update."

[7] Nigeria Federal Ministry of Agriculture and Water Resources. "Agricultural Production Survey."

- Based on an estimated annual rice consumption of 5 million MT in Nigeria, per capita consumption is 32 kg per annum, which is consistent with the USDA estimates from the early 2000s. This consumption is higher in the urban areas, averaging 47 kg per annum.

The central goal of this study is to provide an overview of Nigeria's rice value chain, examine the role of rice in Nigeria's food security and present a practical vision for the development of the domestic rice value chain. This will place an intensive focus on the multitude of factors currently preventing self-sufficiency and a corresponding set of programmatic recommendations aimed at increasing the quantity, quality and accessibility of domestic rice production. These recommendations will necessarily take into consideration the enterprise dynamics within the value chain in order to create incentive structures that are conducive to stimulating sound private-sector investment and upgrading.

Notably, Nigeria imports the vast majority of the agricultural products its population consumes. This stands in stark contrast to the position Nigeria held 35 years ago, when the country was a significant exporter of food products. Huge gaps exist between current levels of production and potential yields. This is a consequence of highly distorted agricultural input markets, poor on-farm production practices and insufficient high-quality processing capacity; each of these conditions is sustained by erratic and poorly implemented government industrial policies that ultimately discourage private-sector investment. This dynamic is examined in the following sections.

[8] Nigeria Federal Ministry of Agriculture and Water Resources. "Agricultural Production Survey."

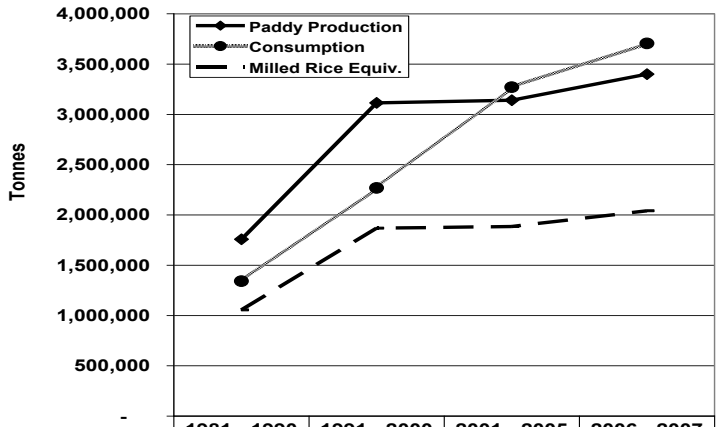
II. FOOD SECURITY IN NIGERIA[9]

The *Global Hunger Index*, published by the International Food Policy Research Institute (IFPRI), ranks developing countries according to their performance on three indicators: proportion of undernourished as a percentage of the population, prevalence of underweight children under five and child mortality. On a scale of 0-100, with 0 indicating the absence of hunger in a given country, Nigeria's 2008 ranking was in the 10-19 range, labeled "serious." The population segments with the highest vulnerability to food insecurity include poor farming households in the Sudano-Sahelian zone of Northern Nigeria and the humid forest zones of Southern Nigeria, and pastoralists scattered over Northern Nigeria. The Sudano-Sahelian zone is particularly drought-prone, the humid forest zones are particularly flood-prone, and pastoralists commonly face fodder and water deficits due to low rainfall situations in the North. See Annex 8 for a more detailed discussion of these food-insecure populations.

In 2008, Nigeria released its National Program for Food Security (NPFS), laying out dozens of constraints to food security in Nigeria and adopting a "value chain approach" to address these constraints. The vision of the NPFS is "to ensure sustainable access, availability, and affordability of quality food to all Nigerians and to be a significant net provider of food to the global community." Considering Nigeria's current position as a net importer of food products, this vision will take time to realize. The short-term objectives of the NPFS are doubling the domestic production of cassava, rice, tomato, sugar and cotton, and increasing the production of millet, wheat and poultry by 50 percent. The medium-term objectives include increased processing and storage capacity as well as development of the market and physical infrastructure required to achieve food security.

Figure 1 below demonstrates the steadily increasing consumption of rice in Nigeria, as well as the widening gap between domestically produced rice and imports. The difference is even more accentuated than it appears here since Nigeria's imports are underrepresented in this chart.

Figure 1. Comparison of Consumption and Domestic Production (from the National Rice Development Strategy)



	1981 - 1990	1991 - 2000	2001 - 2005	2006 - 2007
Paddy Production	1,758,132	3,113,800	3,139,400	3,400,000
Consumption	1,340,588	2,267,615	3,270,270	3,704,675
Milled Rice Equiv.	1,054,879	1,868,280	1,883,640	2,040,000

Consumers are exhibiting a shift in preference from traditional staples (such as cassava, maize and yams) to rice,[10] especially in the urban areas where rice consumption is increasing most rapidly. Statistics from a 2003 rice

[9] This section draws from the work of USAID's FEWSNET Program. www.fews.net

[10] Nigeria National Rice Development Strategy 2009.

consumption survey showed that people in large cities like Lagos, Abuja and Makurdi (per capita consumption of 64, 64 and 72 kg per annum, respectively) consume significantly more rice than people in the rural areas, and the vast majority of the rice consumed in cities is imported.[11] The National Rice Development Strategy (NRDS) anticipates that demand projections for 2009, 2010, 2013 and 2018 will steadily increase to 5.7, 5.9, 6.2 and 6.9 MT (note that these projected quantities take into account more realistic import figures in the range of three million MT per annum).

THE NATIONAL RICE DEVELOPMENT STRATEGY

The NPFS lists rice as the second most important food security crop. It is important both for consumption and as a source of revenue for small farmers in rural areas. Eighty percent of the rice crop is marketed, and it generates the largest contribution to rice producer household income, allowing the household to purchase other foods. The NRDS recognizes the importance of the value chain approach, but is government-driven and does not reflect coherent incentives to upgrade private-sector participation to respond to the challenge. The NRDS calls for the Federal Ministry of Agriculture and Water Resources (FMAWR) to assist with the doubling of rice production through the procurement and distribution of farming machinery for land clearing and preparation, and subsidized basic inputs (seeds, crop control and protection [CCP] and fertilizers) for rice production. In order to increase the area under rice cultivation by 300,000 hectares, the FMAWR also plans to "build and maintain the irrigation infrastructure" for rice and be able to offer a guaranteed minimum price to rice farmers for their output. The NRDS does call for private investment in domestic processing capacity, and hopes to incentivize the development of up to 50 new industrial rice mills through subsidies. But the NRDS does not recognize the difficulties related to the actual development of the supply of quality paddy, the incentive structures and delays involved in developing processing capacity, and the challenges of matching the two so that the value chain will develop efficiently.

The funding plans for the NRDS draw on FGN revenues, donor programs and bank lending. What would make this stand out from previous efforts is close monitoring and evaluation of the program's objectives and public-private dialogue that addresses the progress of the NPFS (or lack thereof).

[11] WARDA. "Imported Rice Retailing and Purshasing in Nigeria: A Survey."

III. RICE PRODUCTION IN NIGERIA

Table 1 provides the breakdown of geographic zones of production and the production systems. It must be noted that current yields per hectare are approximately 50 percent of the potential yield. If proper agricultural practices were followed in terms of input application, plant husbandry and post-harvest handling, more of the potential would be reached.

Table 1. Rice Production Systems in Nigeria

Production Ecology	Major States Covered	Estimated Share of National Rice-Farmed Area	Share of Total Domestic Production	Average Yield/Ha	Potential Yield/Ha (author est.)
Rain-fed Upland	Ogun, Ondo, Abua, Osun, Ekiti, Oyo, Edo, Delta, Niger, Kwara, Kogi, Sokoto, Kebbi, Kaduna, FCT, and Benue	30%	17%	1.7 MT	3.5 MT
Rain-fed Lowland (AKA "Fadama")	Adamawa, Ebonyi, Ondo, Ekiti, Edo, Delta, Rivers, Bayelsa, Cross River, Akwa Ibom, Lagos, and all major river valleys	47%	53%	2.2 MT	5 MT
Irrigated	Adamawa, Niger, Sokoto, Kebbi, Borno, Benue, Kogi, Anambra, Enugu, Ebonyi, Cross River, Kano, Lagos, Kwara, Akwa Ibom, Ogun	17%	27%	3.5 MT	6 – 7 MT
Deep Water Floating	Flooded areas: Rima Valley in Kebbi State and deep flooded areas of Delta State	5%	3%	1.3 MT	2.5 MT
Mangrove Swamp	Ondo, Delta, Edo, Rivers, Bayelsa, Cross River, Akwa Ibom	1%	1%	2.0 MT	4 MT

Source: Ezedinma 2005

The quality and quantity of domestic rice production varies according to the ecology within which it is grown:

- The rain-fed lowland production systems (Fadama areas) are currently yielding an average of 2.2 MT of paddy per hectare, but can reach up to five MT of paddy per hectare when using all of the right practices and inputs (fertilizer, chemicals and seed).
- Rice production in the irrigated areas has the highest average yields (3.5 tons per hectare), but is also producing at about 50 percent of potential due to poor practices.
- Upland rice production is quite erratic in its yields, and significant quantities are consumed by the farming household.

Farmers can be divided into different categories depending on their farming strategy. The typical smallholder (90 percent of the total) uses a low-risk, low-input, low-yield strategy that requires a minimum of purchased inputs (fertilizer, seed and CCP). Such systems produce less than 2 MT per hectare. More commercially oriented farmers using a correct package of practices and applying the right levels of inputs (seed, fertilizer, CCP and labor) are closer to reaching the potential yields.

A wide variety of improved seeds are available in Nigeria, produced by the National Cereals Research Institute, often in conjunction with the West Africa Rice Development Association (WARDA). The varieties are widely known, from NERICA (the New Rice for Africa, developed in the 1990s) to Nigerian varieties that offer a range of characteristics around length of growing season, size of the grain, water requirements, etc. Farmers generally use a seed that is adapted to their conditions. The biggest challenge is to get farmers to purchase new seeds on a regular basis, reinvigorating their productive potential, rather than planting old seeds that have lower yields.

The use of mechanized soil preparation is limited primarily to farms that are larger than 2 hectares, or are part of a larger production system conducive to mechanized plowing (such as most of the irrigation schemes). Smaller farms tend to be fragmented and difficult to plow mechanically. Additionally, the high cost of tractor services makes it just as economical for small farms to prepare the land by hand.

There is strong potential to increase productivity if the right conditions are put in place. The USAID MARKETS project, through its four-year effort with Olam, has demonstrated that on-farm productivity can be doubled by linking farmers with a reliable market and ensuring the delivery of proper inputs, adoption of a package of practices and a steady supply of good extension services. With significant investment from USAID (over $1 million), this pilot program has developed a contract growing scheme for Olam that has managed to enlist 10,000 contract farmers spread across three states.

POTENTIAL FOR INTENSIFICATION

There is significant room for intensifying production on both the irrigated and the Fadama lands if the right conditions are present. The necessary conditions include access to the right inputs (high-quality seed, fertilizers and CCP) credit to purchase the inputs, extension services and a reliable market outlet willing to pay regularly for the paddy. However, these conditions rarely exist. Achieving significant improvements in productivity will require a concerted effort that must be tied to a market that is willing to pay on a regular basis and will guarantee the uptake of the production.

POTENTIAL FOR EXTENSIFICATION

The government has set a target to increase rice-producing areas by 300,000 hectares. The potential for expanding rice production varies by state and production system. There are substantial quantities of unexploited Fadama land in several of the leading rice-producing states that could be brought into production very easily by small farmers. In the southern parts of Nigeria, with higher population densities, land is at a premium and it is difficult for farmers to gain access to additional land.

Extending the area under irrigation presents further challenges. The main issues deal with investment in developing the irrigated land and proper management once land is developed. Even though Nigeria has invested in dams that could potentially irrigate 725,000 hectares, only about 220,000 hectares are currently serviced (according to the NPFS), and only part of this area is for rice. These challenges require significant investment by the government and are greater than the challenges associated with extending production into Fadama lands. Annex 2 provides a lengthier discussion on the issues surrounding the expansion of rice production in irrigated areas.

IV. BUSINESS ENABLING ENVIRONMENT

Collectively, the policy, legal, institutional and regulatory conditions surrounding Nigeria's rice value chain (and agricultural sector) constitute more of a business *disabling* environment than a business enabling environment. Nigeria's policy process is unclear, chaotic and often dominated by rumors and assumptions of personal gain over national or state priorities or private-sector competitiveness. The policy process is made more complex by the multiple policies that exist at the national, state and local levels that can often run counter to one another, especially with regard to developing a functional and commercially oriented agricultural inputs sector. The list of policies in Annex 3 demonstrates the extent of government involvement in the agricultural input industry. Government credibility is further marred by a commonly observed implementation gap that divides sound policy rhetoric from any evidence of positive impact at the farm level. The lack of transparency and predictability surrounding Nigeria's agricultural policy framework makes it highly risky for actors in the rice value chain to invest in much-needed operational upgrades.[12]

Despite this negative picture, the World Bank's sub-national Doing Business in Nigeria Report[13] reveals tremendous variations in the quality of the business environment between Nigerian states. The time and cost of starting a business, registering property, dealing with licenses and enforcing contracts all vary remarkably among states.[14] To date, the World Bank and DFID's Investment Climate Program and impending GEMS Program are the only two explicit attempts by the FGN or donors to stimulate dialogue and action around the concept of inter-state competition. One of the benefits of a decentralized governance system is that competitive pressures between states or even local government administrations can catalyze policy innovation, yet this dynamic has only recently begun to be nurtured through the aforementioned donor programs. The extent to which a particular state is receptive to the concept of the private sector as the engine of economic growth should be seriously considered before any private-sector development donor programs begin implementation.

The absence of reliable statistic-detailed key metrics inhibits a more thorough understanding of Nigeria's rice value chain. This includes: rice production, rice imports (both legal and illegal) and availability and utilization of key agricultural inputs such as rice seeds, fertilizer, pesticides and tractor services. There has been no impact analysis focused on the effectiveness of government policies, such as the extensive subsidization and attempted delivery of key agricultural inputs, high tariffs/levies on rice imports and various other regulatory initiatives that have deeply embedded government institutions in Nigeria's rice value chain. FMAWR carried out no primary research or economic analysis in setting their targets for the rice development strategy.[15] Improving both the reliability of agricultural statistics in Nigeria and analysts' capacity to deliver evidence-based policy recommendations is of great importance if Nigerian agricultural policymakers are to be held accountable for the success or failure of specific policies.

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[12]For a more detailed study of agriculture investment opportunities in Nigeria, see *Agriculture in Nigeria: Identifying Opportunities for Increased Commercialization and Investment*. IITA, 2005.

[13] Doing Business in Nigeria, Comparing regulations in 10 states and Abuja, World Bank & IFC, 2008.

[14] In Kano State, for example, the state government is known for its commitment to economic growth, poverty reduction and business environment reform via private sector development. This legitimate reputation makes Kano one of the more attractive Nigerian States for private-sector investment. Kano is one of the states participating in a huge fertilizer voucher program being administered by the IFDC, with partial USAID funding. This voucher program is designed to build the sales capacity and name recognition of commercial agro-input dealers in the state.

[15] Personal communication from the director of the process.

Corrupt practices by some government officials and bureaucrats have contributed to poor policy implementation. For instance, with regards to the FGN and various state governments' long-standing fertilizer subsidy programs, distribution of fertilizer remains a major problem. It is not uncommon for fertilizer to be given to non-farmers or diverted to destinations for which it was not originally intended. Often, government officials distribute fertilizer for political patronage purposes.[16] This leads to obvious productivity problems at the farm level and an overall crowding out of potential commercial input dealers. Existing agro-input dealers have weak market networks, a sign of the disincentive to investing in expanded points of sale due to government-inflicted distortions in the fertilizer and seed markets. A 2008 study by the International Fertilizer Development Corporation (IFDC) details the state of the three companies that are importing and distributing fertilizer: "Golden Fertilizer has nine sales representatives and 350 individual customers. TAK Continental has some warehouses but is essentially a procurement and distribution agency for the FGN. Notore is considering the development of 2,000 farm service centers but had not finalized a marketing strategy as of 2008."[17]

TRADE POLICY

Cross-border trade in Nigeria faces multiple challenges, from poor infrastructure—notably poor roads and inefficient, expensive and congested port facilities—to lack of access to credit. The National Customs Service (NCS) has historically been perceived as corrupt. Many within both the government and the trade community believe that the NCS has not implemented required reforms and that broad-based FGN commitment and NCS leadership is required to improve trade facilitation. Pervasive smuggling—often with the cooperation of the border agencies—creates a burden for trade, makes generation of reliable statistics difficult and impedes the streamlining of border procedures.

Nigeria's protectionist stance on rice imports drastically inflates the retail price of imported rice. The resulting price differential deflects the competitive pressures needed to catalyze upgrading by key agents in Nigeria's rice value chain. While the intent of protection is to incentivize investments in production and process upgrading and greater value chain coordination, Nigeria's investment climate is prohibitively murky, ultimately disincentivizing investment on the scale that is needed. Additionally, across the five Nigerian states visited during this study, the authors observed an approach to retail pricing that virtually pegged the price points of domestic rice to the price points of imported rice—an approach with potentially devastating implications for Nigeria's food security. In 2008, when a global supply shortage doubled rice prices, Nigeria reduced its rate of protection from 100 percent to 0 percent for a 6-month period to alleviate food security concerns. However, key informants for this study indicated that the temporary removal of trade barriers did not result in reduced retail prices for imported rice due to inflationary pressures. In October 2008, the rate of protection was raised from 0 percent to 32.5 percent, where it remains as of June 2009.[18]

ABSENCE OF POLICY IMPACT ANALYSIS AND PUBLIC-PRIVATE DIALOGUE

Public-private dialogue should be included in any value chain strategy, as it is essential to ensuring transparency, accountability and private-sector participation in the formulation and implementation of agricultural policies. Both the NRDS and the NPFS identify increased public-private dialogue and participatory policymaking processes as priorities. At the national level, the dominant steward of public-private dialogue has been the National Economic Summit

[16] New Nigeria Foundation, "Ofada Baseline Survey."

[17] Gregory, D. Ian, "Report on 2008 and 2009 Fertilizer Voucher Program."

[18] USDA Foreign Agricultural Service GAIN Report. "Nigeria Grain and Feed Rice Update.". Over the last ten years, the rate of protection in rice imports has evolved as follows: 1999—50 percent; 2001—85 percent; 2003—100 percent; 2005—110 percent; 2007—100 percent; and 2009—32.5 percent. A predictable side effect of such protectionism is the prevalence of rice imports smuggled through illegal channels; estimates stand at approximately 800,000 MT per annum.

Group (NESG). The NESG was established in 1996 as a platform for public-private dialogue, and subsequently began coordinating an annual conference that brought leaders from the private sector, government and civil society. In the past, each NESG conference has focused on large-scale issues like privatization of the telecom industry and the need for stabilization of key macroeconomic indicators. But in 2008, with guidance and financial assistance from the DFID-funded PrOpCom Program, NESG launched the NESG Rice Network. Annex 2 details the Network's 2009 agenda and the composition of the network's membership.

CREATING A COMPETITIVE ENVIRONMENT FOR RICE VALUE CHAIN

Protecting the interests of consumers and ensuring that entrepreneurs have an opportunity to compete are important aspects of competition law in any country. With regards to the rice value chain in Nigeria, although some policies aimed at growing the value added domestically have stimulated investment in upgraded rice processing facilities, a host of other government policies and institutional arrangements have prevented the rice value chain from developing into a productive and dynamic industry. In 2005, the FGN encouraged the investment of large multinational rice companies (e.g Olam, Veetee and Stallion Group) into rice processing in Nigeria by granting them licenses to import brown rice at a preferential tariff rate of 50 percent.[19] License holders were expected to invest in rice processing and cultivation schemes in return for the exclusive license to import brown rice for polishing. Two importers established polishing mills. One of them (Olam) invested in the cultivation of domestic paddy via contract farmers, and two (Olam and Veetee) invested in full rice mills. The FGN abandoned the exclusive licensing scheme within two years of its introduction, but not before Olam and Veetee had made large investments in refurbishment and/or new mill construction.[20] The limited impact from these efforts shows the importance of developing consistent policy and addressing the constraints at each level of the value chain, not just processing.

INFRASTRUCTURE AND FINANCE[21]

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), with low access and high cost of finance following closely behind.[22] Currently, a lack of regular power from the grid causes investment costs to rise, as all investors (i.e. milling operators) have to purchase generators, and the returns to investment are depressed since self-generated power is three to four times more expensive than power from the grid.[23] The FGN and state governments recognize the importance of improving infrastructure. The President's 7-Point Agenda prioritizes infrastructure as a means of achieving sustainable non-oil growth, recognizing that access to regular and affordable sources of power is imperative for competitive processing and production, and thus key for improving the middle of the rice value chain. Federal and state governments are supporting a series of public-private partnerships to increase power generation, though it is too early to determine the impact of the partnerships.

Access to finance for agricultural investment has been low in Nigeria. The ratio of private credit to GDP, a causal factor in growth and poverty reduction, was only 22.8 percent in 2007,[24] which is much lower than countries of

[19] In 2005, at the time of the preferential tariff policy, estimates of the prevailing tariff rate for imported rice range from 100-150 percent, so reducing the rate to 50 percent for brown rice would have provided a significant price advantage, stimulating investment in rice milling machinery.

[20] DFID and World Bank Nigeria. "Identifying Growth Pole Value Chains for Cross River, Kaduna, Kano, and Lagos States."

[21] This section draws on DFID's Concept Paper for the Nigeria Growing Employment in States Program.

[22] Nigeria: Growth & Competitiveness, World Bank Country Economic Memorandum. This finding is confirmed by the World Bank's Nigeria Investment Climate Assessment 2008.

[23] Solar energy alternatives were not explored for this study.

[24] World Bank. "Nigeria: Employment & Growth Study."

comparable GDP. Additionally, the cost of capital was close to 30 percent when all charges were taken into account. Such a high cost of finance depresses returns to investment, especially long-term investment in fixed assets, which is essential for increasing economic growth and competition. Further, from a financial-sector perspective, productivity levels in rice farming are mostly static while the business environment for agriculture is generally poor, which leads private banks to reject the prospect of agricultural lending on a large scale. Part of the NPFS is targeting agricultural finance, with discounted windows for commercial banks to access capital, but small farmers are still challenged in accessing commercial finance.

LAND POLICY AND ACCESS TO LAND

The Land Use Decree of 1978 drives all land use policy in Nigeria. All land is controlled by the state or customary authorities; federal land in the states is managed by the Federal Ministry, while non-federal "customary" land is managed by the local councils. Because of the burdensome requirements and long process of transferring ownership, farmers cannot easily use land as collateral for finance.

Despite these issues, where land is not in use, farmers can rent it from the state, or local councils can approve access to it. Population density plays a role in land access, since in the most densely populated states, such as those of the Southwest, there is limited land available. In less heavily populated states, such as Niger, Benue, Kaduna and Taraba, there is plentiful and easily accessible Fadama land for rice production. Access to operational irrigated land is more difficult, since it is in short supply.

V. END MARKETS

Nigeria is a major consumer of rice. Per capita consumption has been increasing steadily since the 1970s when it was 3.4 kg per capita—today it is over 30 kg per capita and the cumulative national consumption is approximately five million MT.[25] There are two discrete market segments for household rice consumers: (1) high-quality rice consumers, who are less price sensitive and seek better cleaned rice, and (2) lower-quality rice consumers, who are more price-sensitive and prefer the taste of local rice. As noted earlier, the higher-quality rice is consumed primarily in the urban areas. A third market segment is the institutional/food service markets (restaurants) that purchase in larger quantities to prepare and sell. They purchase mainly imported rice, but are less concerned about the quality variations between the types of imported rice.

Figure 2. Consumer Rice Consumption Criteria

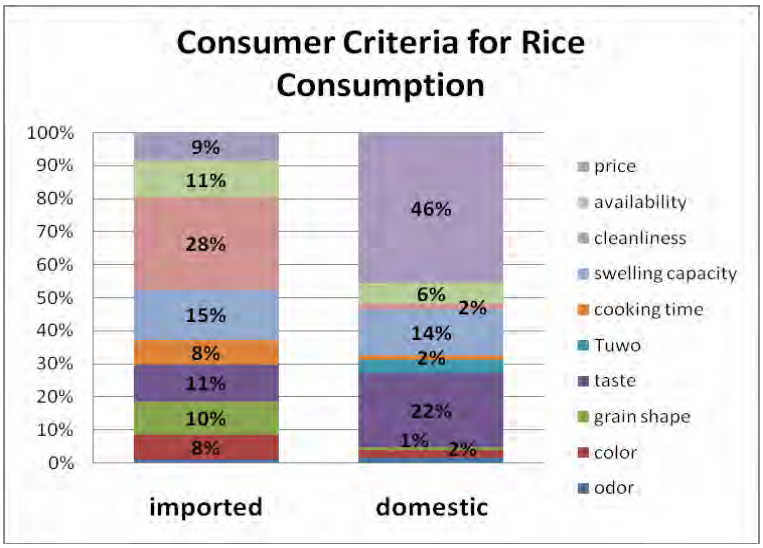


Figure 2 highlights the main differences in consumer purchasing criteria between imported and domestic rice. The most important features for imported rice are cleanliness, swelling capacity, taste and ease of preparation. The ease of preparation is particularly important in the urban areas, where consumers value convenience due to busy work schedules. The majority of imported rice is of a high consistency in terms of size, variety, color (most has been color sorted) and cleanliness.

Domestic rice, by contrast, tends to be brown rice. Generally it has been milled one time (de-hulled), is not polished, has great color variation, may contain mixed varieties in a single bag and has many stones. Price differentiation between imported and domestic rice is about 20-30 percent. With estimated consumption of nearly 3 million MT, the most rapidly growing end market segment is the higher-end consumer, which is being met by imported rice.

For both domestic and imported rice, there is a strong consumer preference for parboiled rice. Most of the rice currently sold has been parboiled, which allows it to cook faster, prevents the grains from sticking together and offers higher nutritional content relative to rice that is not parboiled.

In addition to local consumption, there is a vibrant rice trade in Northern Nigeria. Nigerian traders are constantly moving rice and other agricultural products from Niger and Cameroon into Nigeria. They will then re-export the products to Niger and Cameroon as markets demand. While there are no hard statistics on these import-export volumes and values, they are small in comparison to national figures.

[25] WARDA. "Africa Rice Trends: Overview of recent developments in the Sub-Saharan African rice sector." It is important to note that there is a major difference between the FGN's statement that Nigeria produces 3.5 million MT and the import figures of 2.8 million MT per annum (legal and illegal). However, on closer inspection, the quoted 3.5 million MT of production confuses paddy with rice, so actual production in 2007 in Nigeria was 3.4 million tons of paddy, which is estimated to be about 2 million MT of rice applying a paddy to rice transformation rate of 60 percent. Considering that production in 2006 was only 2.8 million MT of paddy, this is about 1.7 million MT of milled rice. Rice import statistics show erratic fluctuations, but official import stats from the International Trade Center show increasing levels of rice imports in Nigeria.

The government of Nigeria also purchases local rice for its National Emergency Marketing Agency (NEMA). Under the new Food Security strategy, the government will be holding national stocks of upto 200,000 MT of rice,[26] which it can then sell or release as necessary.

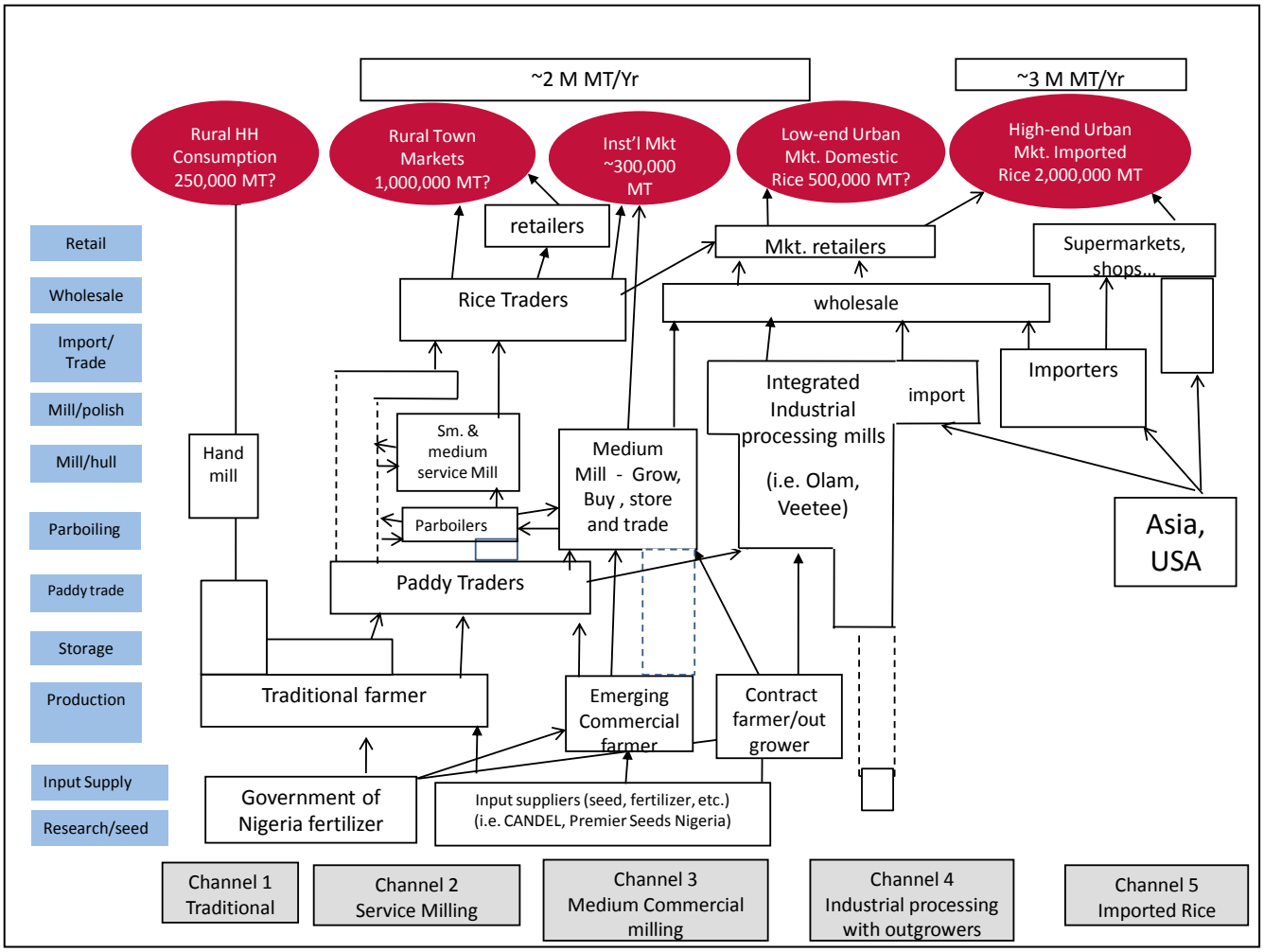
[26] The authors believe that the bulk of this is imported rice. They were unable to find figures on current or previous levels of stored rice.

VI. VALUE CHAIN ANALYSIS

A. STRUCTURE OF THE RICE VALUE CHAIN

Analyzing Nigeria's rice value chain is complicated because of the size of the country, the prevalence of different production systems (rain-fed highland, rain-fed lowland, irrigated and swamp rice), and the range of processing clusters. The difference in processing clusters is significant because of the flow of rice from states without developed processing to states that have developed processing capabilities (this dynamic is explained below).

Figure 3. Nigerian Rice Value Chain Map



Since the main objective of this study is to develop a strategy for increasing the competitiveness of Nigeria's rice value chain and its contribution to Nigeria's food security, the authors will devote limited space to describing the value chain structure, choosing to place greater emphasis on value chain dynamics and the problematic incentive structures that currently prevent more widespread upgrading and greater competitiveness at each of the production, processing and marketing functional levels.

Given the vast size of the country, the channels illustrated in the value chain map will be characterized by different structural permutations and cost build-ups depending on the geographic zone. There are five main channels that supply rice to Nigerian consumers:

1. **Channel 1 serves the rural village market and is supplied by traditional farmers.**

This channel is supplied by traditional farmers who largely produce for personal consumption but sell their surpluses to the rural village market.

2. **Channel 2 serves rural market towns and is a highly disaggregated channel that accounts for the majority of all marketed domestic rice.**

In channel two, rice normally changes hands at least four times en route to the end market and can include two types of service provision: parboiling and milling. This channel is characterized by speculation and trading as the product moves up the value chain. There is relatively little investment made by any of the actors along the chain—a low-risk strategy that equates to a low input-low output cycle. This is the dominant channel in the rice value chain, currently handling more than 80 percent of all of the rice that is processed and marketed, with thousands of millers around the country.

3. **Channel 3 serves the middle-end urban market and includes medium-sized mills.**

In this instance, medium-sized is relative. These mills might process between 500 and 2,000 MT of rice per annum, but the actual quantities that they sell are smaller, which is often a function of their access to supply. Then mills will do the parboiling artisanally, though a few of them now have small mechanical parboilers. The core supply for these mills comes from millers' own production of quality paddy on medium to large-sized farms (20-50 hectares). This is complemented by paddy from outgrower schemes, where they provide inputs and sometimes cash to their farmers (who have come from channel two).Unfortunately, they often only receive limited amounts of paddy from the outgrowers (less than one MT per hectare that is financed), which is enough to pay off the debt. The farmers will then hold the rest for sale later in the year. Mills will also purchase additional paddy on the open market, but the quality is not consistent and will go into a lower-end brand. This channel has between 20 and 30 mills and only produces an estimated 10,000-20,000 MT per annum.

4. **Channel 4 is the large-scale, directed, industrial mill channel targeting import substitution with high-quality locally grown rice.**

There are currently only two mills in this channel: Olam and Veetee, which both came online at the end of 2008. Over the last four years, and with substantial assistance from USAID, Olam has invested in developing 10,000 contract growers to ensure a regular supply of quality paddy for its top-end product. Close to 20,000 contract growers are actually needed. Olam guarantees the delivery of necessary inputs to the farmers, assists them with access to credit through commercial banks, and buys all of their product. USAID supports the softer side of the directed channel development by funding extension services to ensure that the right package of practices (POP) is adopted by the farmers. Veetee did not invest in developing growers and now has problems sourcing quality paddy for their mill. Due to the FGN's industrial mill initiative, it is expected that ten new mills will be online within five years, so there will be a need for a significant increase in supply of quality paddy.

5. **Channel 5 is the imported rice channel, predominantly serving a high-end urban market.**

There are a number of major multinational corporations that dominate legal rice importation, including Stallion, Veetee, Olam and others, that import 200,000 MT or more per annum on a regular basis. This rice is usually packed in Thailand in the final branded bags for each major group and contains a series of different levels of quality and price in the respective product categories. These major distributors have well-developed systems for selling to wholesalers, though most of the sales take place in Lagos. Some of them have invested in polishing plants to polish brown rice into finished white rice. This was a result of the reduced duty regime for brown rice (compared to completely milled rice) that was provided to importers who attained a special license, although the special duty regime is no longer in effect.

SECTORAL DYNAMICS

The most steadily growing channel is the imported rice channel (channel five), which delivers high-quality rice primarily to urban consumers.

Regarding domestically produced rice, channel two has been fairly stagnant for a number of years. The vast number of participants in channel two makes it difficult to achieve greater efficiency. The value added is cut into so many pieces and there are so many actors, each trying to maximize their personal benefits, that competing forces prevent the development of strong win-win relationships that could eliminate other participants.

Channel four is a new channel and appears to be the target of significant investment and growth to build on the opportunity to take market share from imports. While this offers strong potential, it is only in the early stages. The two leading investors in this sector are former commercial traders and do not understand all of the requirements for building a sound supply chain. Predatory behavior by these investors, should it happen, could hinder channel four's future growth.

THE FUNCTIONS AND ACTORS

As a strategy is developed for long-term growth of the value chain, it is important to understand the different types of actors at each level of the value chain and the incentives that drive them in order to target the necessary behavioral changes. The main functions in the value chain for Nigerian domestic rice are production, harvesting/storage, aggregation of paddy by traders, parboiling, milling, trading/wholesaling and retailing. The main actors in the system are local farmers, paddy traders, millers, rice traders and retailers.

1. LOCAL PRODUCTION AND MAJOR TYPES OF FARMERS

Farmers can be categorized as follows: (1) smallholders using a low-risk, low-input, low-yield strategy that requires a minimum of purchased inputs (fertilizer, seed and CCP) with yields of less than 2 MT per hectare; (2) larger-scale commercial farmers, generally retired military or civil servants, who produce on 20 or more hectares, may own their own processing equipment, and purchase paddy from other farmers to "top up" their processing capacity; (3) a new category of contract growing farmers or outgrowers, emerging from the smallholders, who, with the assistance of the lead firm, are adopting improved production practices, are accessing the right inputs and are linked into the commercial channels. Getting the smallholders to shift to contract growing requires both operational systems and demonstrated incentives to making the shift.

2. PADDY TRADERS

Paddy traders play a critical role in Nigeria's rice value chain. They are often the source of short-term finance for the farmers and buy as much as they can at harvest (some in repayment for loans). They will store some paddy to sell later. The paddy traders often have some from their own production (or from their family) and then purchase the rest of their stock. In many parts of Nigeria, much of the local paddy trade between producers and local traders is dominated by women who take the surplus production from their husbands, complement it with other paddy purchases, and then either take it to the mills for processing and sale to rice traders, or sell it to other intermediary paddy traders or millers. Since they thrive on the additional margins stemming from market inefficiencies, they have the least incentive to see the value chain working more efficiently.

3. PARBOILERS

Most Nigerian rice is parboiled before milling, adding significantly to the cost of the finished product. Most parboiling is carried out at the artisanal level.

Only the two major industrial mills have large mechanical parboilers, but this is still the main point of constriction in the flow of the rice mill. The NCRI has developed a mechanical parboiler appropriate for 300-500 kg of paddy at a time, but it is not widely used due to cost. Artisanal parboiling will be a casualty in the upgrading of the entire channel.

Figure 4. Traditional parboiling operation of a medium-sized milling/parboiling company in Kano State

4. MILLERS

Small mills dominate the processing of Nigeria's domestic paddy. There are several different types of small millers—those who mill primarily as a service and those who purchase paddy and then mill for personal uses. The value of the actual milling service is quite low (less than one percent of the end value of the rice), with the main margins made in the trading functions from purchasing paddy and then selling it as milled rice to rice traders. The small margins disincentivize the investment of marginal improvements in rice processing capacity by small millers.

In the heavy production zones (such as Bida in Niger State, Abakiliki in Ebonyi State and Laffia in Nasarawa State), there are clusters of small mills that attract both paddy traders and buyers and ultimately serve as milling, parboiling and marketing hubs. In the Abakaliki rice milling cluster, there are a number of de-stoning service providers that refine traders' freshly milled rice to clean it of foreign matter.

There is a class of medium-sized mills that are typically integrated with relatively large-scale paddy production operations. They are often more than 15-20 hectares and owned by retired civil servants and military officers. These mills can be incentivized to upgrade.

This year, two new large-scale industrial mills owned by major multinational food companies (Olam and Veetee) began operating in Nigeria. Each mill has the potential to produce cleaned and polished rice that can compete with imported product. Three other large mills formerly owned by the government have currently stopped operating (Sokoto, Badegi in Niger State and Onitsha in Anhambra).

Figure 5. Rice Wholesaling at Dawanu Grain Market in Kano City

5. TRADERS OF DOMESTIC RICE

Each marketing step from the mill to the consumer is generally a low-margin (less than 15 percent), high-turnover business. Traders buy 100-kg bags at the main processing clusters in volumes of 1-4 MT and then bring them to the end markets for wholesale and/or retail. The end market price of domestic rice is heavily dependent on the price of imported rice—traders are able to sell domestic rice at roughly 15-20 percent below the cost of imported rice. This price margin is transmitted back to the mills where the

price of milled rice is set. This function employs thousands of small traders and some much larger ones.

6. IMPORTERS

The biggest importers have branded varieties that are sold at varying quality and price levels. Major importers, such as Olam, Stallion and Veetee, import 200-300,000 MT of rice per year, packaged into bags that are labeled for Nigeria in the country of origin (e.g., Thailand, India, Vietnam or the U.S.). While imported rice varies in quality, it is all of a higher quality than the domestic rice in channel two. Top-quality imported rice has wholesale and retail prices up to 50 percent more than lower-quality imports, but the vast majority of imported rice retails within a fairly narrow, lower-end range, currently around N9,500[27] per 50-kg bag.

END MARKET OPPORTUNITIES

From the analysis of the markets and the dynamics within the sector, the greatest end market opportunity lies in supplying the high-end urban market. With a total value of roughly $3 billion, this is a very large, established market segment that has been growing steadily for the past decade. It is the highest-price market segment and presents clear opportunities for import substitution. The Olam industrial milling pilot has shown that with proper management of the value chain, Nigerian producers and millers are able to provide a local product that can respond to the demands of this large market segment. Given the total size of this market segment, it is doubtful that Nigerian production can completely replace it, but it should be possible to provide more than a million MT of quality rice within the next decade that can compete with imports.

CHAIN ANALYSIS: CONSTRAINTS TO REACHING END MARKET OPPORTUNITIES

A number of different factors present challenges to providing the right incentives for reaching end market opportunities. The relationships between the actors within the different channels are critical, including both the vertical linkages (coordination between different functional actors) and the horizontal linkages (relationships between actors within the same function). These relationships, as well as the governance structures within the channels, will provide incentives or disincentives to proper collaboration that can lead to a more efficient channel that benefits all the actors.

VERTICAL LINKAGES, VALUE CHAIN GOVERNANCE, TRUST AND RELATIONSHIPS

Vertical linkages in the Nigerian rice value chain are generally very fragmented with limited coordination between actors at different levels. As noted above, channel two, which accounts for the vast majority of domestically produced rice, is characterized by an "arm's length" governance structure where buyers and sellers generally interact on a supply and demand basis. There is some price-setting by the paddy and rice traders who know the market price in urban markets (which is highly linked to the imported price) and then transmit that market price back to the producers. However, at harvest when farmers have the most urgent need for cash, traders try to purchase as much paddy as possible and then store it until the price increases later in the season. The arm's length governance structure makes it difficult for the different actors at each level to coordinate.

Paddy traders do try to control their access to the paddy at the most advantageous prices through credit and social relationships and then store the paddy until they want to market it. These relationships make them the most powerful players in the normally highly fragmented channel, allowing them to capture significant margins.

[27] In June of 2009, the exchange rate averaged 150 NGN: $1.

Channels three and four are still underdeveloped and do not yet have sufficient supply of quality paddy to pay off their investments. In order to guarantee the delivery of sufficient quantities of high-quality paddy for processing, they use a "directed" governance structure. Lead firms have invested in systems to provide the necessary inputs to the farmers to allow them to maximize their production, turning them into contract growers or outgrowers who are committed to providing all of their production to the lead firm. In theory, this structure will ensure the adoption of optimal growing techniques and allow the farmers to maximize their production and revenue, while providing greater quantities of quality paddy to the mills.

Unfortunately, the mills in both of these channels are unable to access as much paddy as they would like to meet their installed capacity. Because the farmers have financial obligations to the lead firms, they must deliver at least enough to pay off their debts. However, because there are many traders and additional market outlets for the rice (into channel two), the opportunities and pressures for side-selling are widespread, pulling paddy out of channels three and four. The advantages to the farmers from side-selling include cash payment on the spot and, occasionally, the higher prices that traders can offer since they have far fewer overhead expenses than the millers. In order to offset this side-selling, the lead firms employ other strategies to ensure that their outgrowers deliver as much of the quality paddy as possible to the mills. For example, some will thresh the rice for the farmer and then take delivery on the spot, while others will provide the transport to get the paddy from the fields to the collection points, ensuring that the rice is not diverted to other traders.

Enhancing trust and developing a win-win relationship between the farmers and the millers is fundamental to the development of channels three and four. The millers could benefit from an increased supply of paddy from the farmers and farmers could increase productivity and returns by working with the millers. However, farmers frequently sell high-quality paddy on the side, even after the mill has provided most of the input costs. A perpetual challenge for the millers is thus to ensure that the farmers deliver the promised quantities of the right quality paddy, rather than sell it on the side. Therefore, transparent mechanisms to build the trust between the two parties and reinforce their win-win relationship are necessary elements in developing an efficient supply channel.

HORIZONTAL LINKAGES

Horizontal linkages between the farmers are often missing or weak in Nigeria. While many farmers are tied into farmer associations, most of the associations were created by the government to enable service provision to farmers rather than as institutions run by the farmers for-self management and farmer-driven access to additional services. The new NPFS is creating 15-20 cooperatives in a set of designated pilot sites to serve as targets for assistance. This has not had any impact on increasing group cohesion because the farmers are grouped only to receive services and are not invested in the activities. However, these pilots can be the starting point for improved development of the cooperatives and effective cooperation if they get the necessary assistance.

The farmers' groups established by Olam are also weak. This is partly because Olam wants farmer groups that will deliver product to them rather than strong farmer groups that can organize against them. The groups are driven by a leader who is incentivized to deliver product to the mills (a 750N bonus per MT delivered by the group), and not to ensure that the members get the best prices for their product. The Olam management model is based on limited competition between crops and between buyers. Olam makes money by selling inputs to the farmers and keeping them tied into their system, so Olam does not want the farmers seeking these services elsewhere for a better price. While this may be a short-sighted strategy over the long term, it is Olam's strategy until private systems are able to reliably handle the distribution of inputs to farmers. As other alternatives arise and farmers find options to access inputs elsewhere or to find other buyers, Olam should eventually shift to a management system that offers a wider range of incentives to foster loyalty and productivity. Since the farmers in the Olam-organized groups are achieving

the higher yields and regular markets for their product, the common experience within the groups can be a starting point for effective cooperation to foster increased upgrading and lowering of transaction costs.

At the milling level, small millers in the major processing clusters (Abakaliki and Bida) have created associations to negotiate with the city government and set standard rates for basic services (wheelbarrowing, loading and unloading trucks, etc.). Because the larger millers in channels three and four are still few in number, they have not developed any coordination mechanisms. If Nigeria is to realize its potential to enhance domestic production, the larger millers will need to develop coordination mechanisms to avoid causing fragmentation of the supply to the large mills, especially during the early years when the millers are in the process of building up their supply.

SUPPORTING SERVICES

Developing the rice value chain in Nigeria will require strong, market-driven supporting services to make inputs and services readily available to enhance the ability of farmers to upgrade their operations and increase their productivity. At present, Nigeria's private markets for agro-inputs and supporting services are very weak, but there are nascent product/service markets (namely agro-input supply) that can be developed with the right assistance and incentives. While the government's NRDS envisions increasing farmer access to needed services, the strategy calls for strong government-led support to provide these services at subsidized prices, which provides weak incentives to upgrade and will likely further crowd out the provision of support services by the private sector. Below is a summary of the status of supporting services.

Input supply: fertilizer. Only a fraction of the fertilizer that is needed to maximize rice production in Nigeria is currently available. The FGN's programs to subsidize and distribute fertilizers have disconnected the private suppliers from their clients. Even though private firms do the importing and transport, these firms recognize that the FGN and state governments are their main clients, not the farmers. Private providers have, in the past, reached out to farmers directly, but they no longer do so. Researchers have likened the private input delivery system to a tree that has been pruned back so drastically that it does not have the branch network to reach the rural areas. There is a strong feeling that if the policy environment changed, then within a couple of years the branch networks would be revitalized.

There are three or four firms that are interested in expanding their outreach. Among them, Notore will soon start manufacturing and marketing fertilizer in Nigeria and is planning on developing a strong distribution network. This will provide an excellent building block for fertilizer and input distribution in Nigeria that targets farmers directly if the incentives are properly aligned.

Input supply: seeds. Farmer preference to use old seed has limited demand for new seed, even though it is a critical aspect of paddy productivity. As a result, there has been limited production of quality seed on a commercial basis. Olam's contract growing scheme requires farmers to use new seed, which Olam itself is producing on 400 hectares and selling (about 700 tons of seed per annum) to its contract growers. This is the largest seed production and marketing activity in the country, but it is linked within the directed channel. Outside this channel, demand remains limited.

Mechanization services. Utilization of mechanization services remains very low, which is a function of the small farms, uneven terrain and the absence of widespread service supply. Though various Nigerian states have tractor hire agencies (THAs) to provide these services, the THAs are irrelevant to the typical smallholder farmer. Though subsidized, THAs are in limited supply and are reserved for farmers with good connections. Under the higher-yield scenarios of channels three and four, additional cropping services such as planting, reaping and threshing can help to resolve labor shortages at peak periods. There is a stronger commercial potential for these services than for plowing.

Although there are no dedicated private tractor service companies, there is a nascent commercial market emerging for mechanization services. Some of the larger-scale farmers who own tractors are plowing for a fee on neighboring farms and some entrepreneurs have purchased reapers and threshers, intending to provide these services to the paddy farmers during the harvest season when labor is in greatest demand.

Under the NRDS, the FGN anticipates importing 10,000 new tractors per annum[28] to be sold to cooperatives at a highly subsidized rate with government financing. There is no indication that cooperatives know what they are getting, whether they can use them, or whether they have the capacity to maintain the tractors once they are delivered. The result may actually lead to crowding out of private services.

Equipment design and supply. Most of the equipment in Nigeria is imported from China, the UK, Korea and other countries, but often the equipment is not appropriately scaled or adapted to Nigeria's conditions. Very little milling equipment is produced locally because demand is so low. An engineer at the NCRI has designed appropriately scaled rice processing equipment for smaller actors (parboilers, de-hullers, polishers, sorters, cleaners and de-stoners), but these are not in high demand by the rice millers. The engineer has his own workshop, from which he manufactures and sells fewer than 10 pieces of equipment per year, mostly to donor-funded projects. One entrepreneurial miller has designed and replicated a de-stoning machine, setting up three of them in the Abakiliki cluster, but the miller has yet to take a commercial approach to the design and sale of de-stoning equipment.

The ability of farmers and millers to purchase mechanized equipment is limited by two factors: their lack of access to finance and a poor understanding of the return on investment that could be elevated through mechanization.

CCP spraying services. CCP spraying services are available within the weak network of commercial agro-dealers that exists, but the agro-dealers lack a strong ability to effectively market and dispense their products. More informed dealers who understand CCP and its various applications for specific problems will improve their ability to advise clients, ultimately leading to greater sales and generating more effective use of the product.

Extension services. The Olam pilot with MARKETS has demonstrated the value that well-run extension services, linked into commercial activities, can provide. MARKETS has been hiring subcontractors to provide these services in three states and providing them with a package of practices (POP) and effective supervision within a commercially managed channel where the farmers can see the benefits immediately. Unfortunately, the MARKETS model is unique. The FGN's Agricultural Development Programs (ADPs), the country's main extension services, have no resources to train their staff to stay current with good production practices or travel to the farming areas to work directly with farmers. A significant amount of productivity advice should come from commercial agro-input dealers, but as discussed above, both the agro-dealer network and the level of knowledge within this network is weak.

Cooperative training services. Nigerian cooperatives are generally weak. They are built to be recipients for subsidized agricultural services and products rather than real producer organizations that seek out commercial providers of services and products that their members need. The cooperatives created by MARKETS and Olam, for example, are primarily focused on being conduits for Olam-provided services. Strong cooperative training services are necessary for the long-term development of channels with more balanced governance structures, which will incentivize farmers to produce more. These services need to be developed.

Financial services. Access to finance is often a critical constraint for agricultural production and comes into play at each step of the value chain. Overall, there is relatively little finance being provided by Nigerian financial institutions into the rice or any other agricultural value chain. Under the NPFS, the Central Bank of Nigeria (CBN) has set up

[28] The Director of Mechanization at the NFRA believes that the FGN does not have the capacity to import more than 3,000 per annum (from personal communication with Director on June 10).

special discount windows for refinancing commercial banks that are lending within the agricultural sector. The CBN has also set up agreements with six banks, providing them with discounted funds in return for their lending at eight to nine percent to mobilized groups of farmers in cooperatives. Directed channels can develop structured finance programs, as Olam has done, to facilitate loans to producers through their linkage with a lead firm.

In its expanded phase, the NPFS is establishing food security sites in 327 communities and establishing over 6,500 cooperatives for a wide range of commodities. Each cooperative will receive a revolving credit fund of 500,000 N, or about 10 million N per community, at zero percent interest. Unfortunately, after the first 2 years of trial, the revolving credit funds have only had about a 70 percent repayment history. Though the FGN hopes to link these cooperatives to CBN-identified financial institutions to participate in their special refinancing schemes, the history of weak repayment on zero interest is not incentivizing for the financial institutions.

Embedded finance has been provided to some farmers by millers via outgrower schemes. In these cases, the millers are seeking increased access to quality paddy. Typically this credit is in-kind, but some medium-sized firms such as ANNES have provided inputs and cash as an advance against delivery of paddy. Olam's arrangement with its contract growers is to provide them only with inputs and no cash, even though Olam is financed by the bank (First Bank of Nigeria) as part of their loan to the cooperatives.

Leasing services are just beginning in Nigeria, but tend to focus on more established SMEs. Such services could be extremely useful for the purchase of tractors, reapers and threshers.

In conclusion, the supporting services necessary to facilitate upgrading by the farmers and the millers are still very weak and in need of significant capacity building. These will start from a more conducive policy environment that does not work against them, but will also require more targeted work with the providers and the consumers of the services to build up the quality of the supply and the solvent demand for those services.

VII. OPPORTUNITIES AND INCENTIVES FOR UPGRADING

DRIVING FORCES OF NIGERIA'S RICE VALUE CHAIN

The main forces driving Nigeria's rice value chain are consumer preferences and increased urbanization. Government policies, both federal and state, also have a strong impact on the development of the value chain.

- Consumer preference for higher-quality rice is very strong and currently there is limited potential for substitution of poorer-quality domestic rice to meet this demand.
- Increasing urbanization is driving the growing demand for rice and negatively affecting the labor supply in rural areas.
- Government policies (both formal and informal) have contributed in a variety of ways to the current value chain structure:
  - Policies surrounding the subsidized supply of fertilizers and tractor services have limited the development of commercial provision of those products and services. Informally, the mechanisms for allocating those subsidized goods have benefited selected individuals but have not reached the smallholders that need it most.
  - Protectionist tariff policies have provided a price umbrella for local rice while not stimulating increased demand for the product or the need for efficient production. However, the policies are driving an expansion of area under paddy production.
  - New government policy to support industrialization via private firms is driving investment, and the price umbrella can make rice very profitable for firms that are investing in true commercial production and processing.
  - State government policies (in addition to FGN policies) are leading to different enabling environments around the country and differentiated opportunities for expansion of the rice industry.

Any strategy to develop the value chain needs to recognize these forces and build on them. The NRDS, by weight of its financial investment, can serve as a tremendously positive driving force in the future if it is effectively managed. By contrast, if the NRDS is mismanaged, it will lead to increased value chain fragmentation and distorted markets up and down the rice value chain.

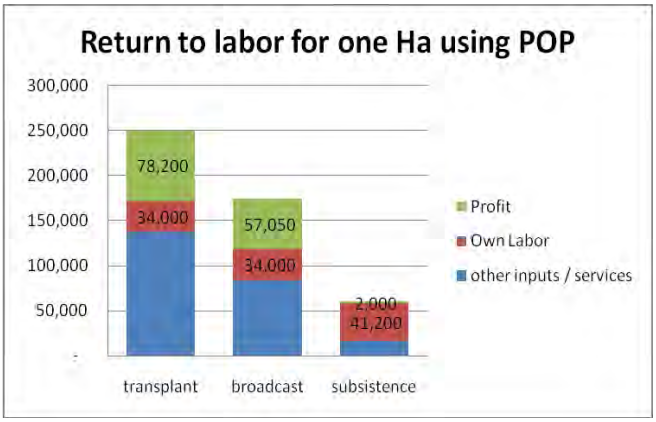


Figure 6. Return to Labor for One ha Using the Package of Practices

MARGIN ANALYSIS

When analyzing the structure of each channel, margin analysis provides insights into why actors perform the way they do. Below is an explanation of the profitability/ return to labor perspective[29] and the

[29] When dealing with small farmers for whom most of the income is actually the cost allocated to their own labor, a return to labor analysis is most effective for comparing profitability.

different margins at each functional level. Annex 1 provides more detailed margin analyses for each channel and functional level in the value chain.

The margin analysis shows that farmers who are using the more sophisticated production technologies in Fadama areas and are linked into regular markets (channels three and four using either transplant or broadcast) are significantly more profitable than farmers who are not using the adapted package of practices (channels one and two). Figure 6 shows that returns to farmers using adapted practices range between 91,000 and 112,000 N per hectare, compared to 43,000 N for farmers using traditional production technology. Therefore, greater investment yields a substantially higher return, so farmers can be incentivized to invest more.

Comparing the number of actors and their margins between the imported rice channel (five) and the dominant traditional channel (two) shows that there is a greater number of participants involved in channel two (as the product changes hands several times), as well as a higher value added captured by the different actors. Figure 7 presents the comparison between a 100-kg bag of rice grown in Taraba, milled in Abakaliki, and wholesaled in Abuja (converted from paddy at 60 percent) compared to 100 kg of rice imported from Thailand. The margin analyses for each product shows that 54 percent of the end value for domestic rice is comprised of trader margins (initial paddy trader/grower, paddy to rice trader, rice wholesaler, and rice retailer), compared to 29 percent from imported rice.[30] The biggest margin is actually made at the paddy trade level, buying the rice at the farm and then holding it to sell to traders who take it to the mills. If a farmer could hold onto the rice longer, the farmer would capture more of this paddy trade margin. For domestic rice, about 75 percent of the other costs associated with the rice value chain are service charges for production labor, loading and unloading, milling and parboiling, meaning 90 percent of the value added in the value chain likely accrues to individuals. With so many different actors in channel two, each capturing a small margin, the actors are always competing and there are few incentives to promote systemic upgrading, even though that is in the best interest of the economy.

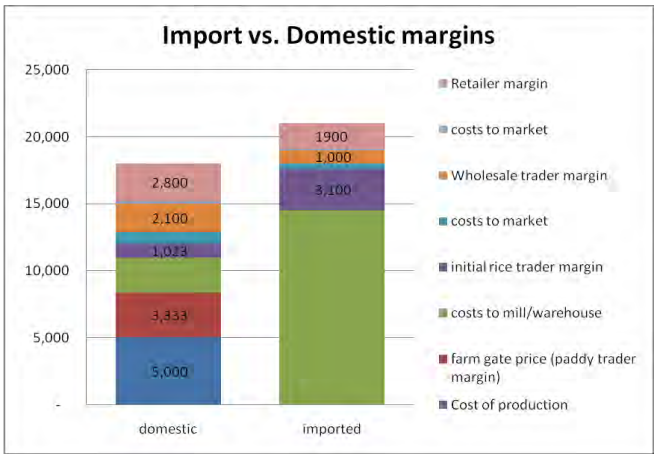


Figure 7. Margins Between Domestic and Imported Rice, per 100 kg of Rice

The margin analyses demonstrate that the financial incentives exist to promote greater import substitution, if the value chain can get its operations working more efficiently. The next section, on upgrading, looks at the key issues for the major supporting services (input supply and extension) and of actors (farms and mills) necessary to drive a better-coordinated, market-driven and efficient value chain.

OPERATIONS UPGRADING

Input level: Unformed, underperforming and distrustful commercial relationships are the main drivers of poor operational performance in the input industry. The most immediate concern for the industry is its minimal commercial footprint and its inability to establish effective networks linked into the smallholder production zones that can deliver a range of seeds, equipment, products and services. Specifically, efficiency gains are needed in the following areas:

[30] See Annex 9 for cost breakdown of imported rice to the warehouse.

- The wholesaling of inputs needs to dramatically shift its focus from a one-client (FGN) business model or a few large-client (FGN and state governments) business model to a volume-based retail model. The volume-based model may include developing one or a combination of wholly-owned distribution structures, exclusive independent shops, basic wholesaling or order point structures. During the early stages of developing a more robust input industry, wholesalers will have to be the driving force of filling the substantial capacity gaps in the retail-to-consumer distribution networks. The wholesalers have been crowded out of this function by government dominance of the distribution networks. The result is pervasive misunderstanding or limited understanding by farmers of the risks and benefits of using inputs including CCP, fertilizer, seeds and mechanized rice farming equipment.

- The retailing of inputs has to become more organized through links to wholesalers or an association of independent retail dealers that can push volumes of CCP, seeds, fertilizer and mechanized farming equipment to smallholders, emerging commercial farmers and large-scale commercial farmers. This will achieve economies of scale and lower the high transaction costs of selling small lots of inputs to rural smallholders. These networks also need to link directly into rural farming communities to develop layered economic activities (sales agents, sprayers, tilling, equipment maintenance, etc.,) in order to deepen the commercial networks and achieve network synergies (mutually reinforcing incentives that speed up the pace of upgrading). Retailers must engage smallholders to ensure they are accessing the right solution for their issue or problem, whether it is a product, seed variety, specific piece of equipment or services, or a combination. Solution-driven promotional efforts are informed by real technical knowledge and should consist of ongoing interaction with the client through local service providers and agents, year-round promotional events, and the use of technology where appropriate to push or pull knowledge. The input industry should be a major driver of change on the farm with a specific focus on shifting farming practices away from extensive (i.e., regular shifting of land using slash and burn techniques) to intensive low-land farming that uses a combination of improved farming practices to maintain soil fertility and productivity gains.

- While the seed industry is an important part of the overall input retail and wholesale functions, it is important to assess the seed network independently. The network for producing and selling rice seeds is just emerging. Nigeria has highly capable professionals that have researched and understand most of the requirements of rice seeds for each of the main rice-growing ecologies in Nigeria. The issue, again, is the network of relationships in the seed industry and the incentives driving the conduct of those relationships. Building private-sector production and distribution networks (in conjunction with other inputs such as CCP, fertilizer and equipment) are essential if quality seeds are to get to the majority of smallholders—and be used effectively.

- Improving access to agro-equipment by both smallholder and medium- and large-scale farmers will come through service providers or farmers that can ensure substantial capacity utilization of the equipment by keeping the equipment active for most of the year. Where possible, the equipment should link with CCP, fertilizer and seed retailers as they have the largest footprint. Further, the prospect of bundling products and services will reduce the high transaction costs of dealing with rural smallholder markets.

- Finance needs to be commercially driven and targeted towards the functions and relationships in the value chain that will bring the greatest upgrading (returns) to the industry. For rice in Nigeria, these are the input industry through equipment and service suppliers, the emerging commercial farmers that want to mechanize and upgrade, and business people that want to start milling, storage, or processing businesses. Finance must also go beyond credit to encourage savings and planning (insurance) services to smallholders, foster monetization of rural economies (via ICT-based transaction services), and equity and bond mechanisms

(especially for SME commercial ventures) as a means to attract liquidity in insurance companies, pension funds and international social investors.

Farm level: The development and strengthening of rice producer organizations (i.e. cooperatives) is the most necessary farm-level upgrade at this point in time. Understanding the fundamental reasons for the formation and evolution of existing producer organizations is instructive. Many producer organizations were and continue to be set up in order to receive government subsidies of some type (i.e. finance, fertilizer, etc.). In other words, the organizations were constructed through an outside directive instead of being set up organically for reasons related to income growth and policy advocacy opportunities. The primary utility of a producer organization lies in its power to reduce transaction costs related to input purchases and output marketing, create a strong platform for political advocacy initiatives, and build trust within communities that are traditionally risk averse. With these benefits in mind, one must recognize the importance of communication, transparency and an equitable institutional structure when it comes to facilitating the development of producer organizations. The following section on strategy explores the "how" of this process.

Mill level: The most important and time-sensitive upgrade that the large milling companies (Olam and Veetee) need to make is in their outgrower schemes. The obvious incentive for driving the quantity and quality of paddy production is to get large-scale mills operating at peak capacity. This requires a continuation of Olam-style outgrower facilitation initiatives. As stated repeatedly throughout this paper, the opportunity lies in capturing a larger share of the market segment now dominated by high quality rice imports. Importantly, although Olam and Veetee are working to enter this market segment, both mills face significant challenges in overcoming the widespread consumer perception that domestic rice is of inferior quality. Olam, which turns out the highest quality domestic rice on a consistent basis, currently discounts its 50-kg bag by about 1,000 Naira at wholesale compared to the regular imports (roughly 15 percent), so that it can gain acceptance and a foothold in the market. Upgrading their brand images in Nigeria is another imperative for the large-scale milling companies. The process of mill upgrading is detailed in the Strategy section below.

PLAYING THE ROLE OF THE FACILITATOR

For donor-funded programs aimed at increasing the quantity and quality of rice produced inside of Nigeria, developing the various markets that make up Nigeria's rice value chain is a key objective. In order to stimulate the development of markets for items such as fertilizer, seeds, paddy production advisory services and rice milling, a donor-funded implementing partner must play the role of market development facilitator. In this context, a facilitator is an individual (or group of individuals) who temporarily works to develop more inclusive, dynamic, and differentiated markets without becoming a part of the markets. In practice, facilitating market development is very difficult as the aim is to catalyze ownership of a process of constant upgrading among the actors in the value chain without creating dependence on the donor-funded project. The economic incentives and cultural norms that drive behavior, along with the constantly changing nature of market dynamics, make the private sector environment fluid, often resulting in conflicting economic and social incentives. It is the job of the market development facilitator, in the face of these conflicting incentives, to foster new and shifting relationships, continuous innovation and shifting benefit flows such that actors in the value chain behave in a way that makes the industry more competitive.[31]

[31] This explanation partially draws on Michael Field's unpublished paper from 2008, "Implementation Overview."

VIII. STRATEGY

VISION FOR THE VALUE CHAIN AND FOOD SECURITY

Rice is an important food crop in Nigeria of national economic and strategic importance. Even though the country produces over two million MT a year, it is importing an ever-increasing amount to meet the growing demand in the urban areas; imports now reach nearly three million MT each year. In recognition of the tremendous amount of rice that is being imported into Nigeria and the significant end market value of the rice (roughly $5 billion), the government is committed to investing in and supporting a program to upgrade Nigeria's rice production and processing capacity. Under the right circumstances, *rice can be competitively produced by smallholders (less than 5 hectares) in Nigeria*. If farmers can double their average productivity to 3-4 MT of paddy per hectare of Fadama and 6-7 MT of irrigated land while meeting the quality standards demanded by the dominant urban end market, they can serve as the foundation for a new milling industry that can compete with imports on price and quality. Increasing the market share of domestically produced rice will expand the depth and breadth of outreach and production to small farmers throughout the country. It will require many new farmers on new land, as well as more intensive and profitable production by existing farmers. It will increase the overall availability of rice in Nigeria (making the country less sensitive to international price fluctuations), improve the accessibility of rice to urban consumers (through a lower price), and improve the food security of rural producers (increasing their available resources to purchase other foods). Replacing imports with domestic production will also save the country needed foreign exchange.

Achieving this vision of import substitution will require significant investment in channels three and four to increase the number of industrial mills and develop the systems and services needed to increase the supply of high-quality rice. The investment in and growth of those two channels will also have a positive spin-off effect on the market and operational efficiency in channel two; with time, the improved availability of inputs and better support services will benefit all producers, reduce the costs of finished product coming out of channel two, and provide the market with greater supply at a lower price.

Therefore, a potential vision for the rice sector in Nigeria is within ten years to "*develop a commercially driven production, milling, processing and marketing capacity that can deliver at least one million extra MT of rice that is cost and quality competitive relative to imports and purchased by the urban markets as a substitute for imports.*"

VALUE CHAIN COMPETITIVENESS STRATEGY

The financial models demonstrate that Nigeria can produce paddy at prices that are competitive with international imports, even without the price umbrella that the tariff and duty protection provides. The spread is sufficient for the intensive domestic producers to compete profitably with imports.

Successfully achieving our vision for the rice value chain will require four elements to come together, three of them driven by the private sector and one driven by FGN, state and local governments:

- continued private sector investment in large-scale milling operations that are able to produce rice that is competitive in quality and price with imported rice
- an efficient, dynamic and commercially-oriented set of rice value chain support service and product providers, including agro-input supply, farm mechanization services, finance, extension services and marketing services

- more dynamic rice paddy producers who are incentivized to invest in improved productivity and expanding production and are tied into the large-scale milling industry

- a business enabling environment marked by value chain assistance policies, laws, and regulations that are formulated in a participatory manner, private-sector driven, managed in coordination with state and local governments, actually implemented, and monitored and evaluated to measure impact

Getting the first three elements of the strategy to succeed is contingent on the construction of properly aligned incentive structures that stimulate private-sector investment in rice value chain inputs, support services, productivity enhancements at the farm level, greater milling capacity and competitive brand images. This process will most likely take longer than the government anticipates, so managing expectations and keeping consistency in the business environment (the fourth element) will be essential.

UPGRADING TRAJECTORY

The vision articulated above comprises a long-term growth strategy that will evolve through several stages. Value chain channel four (the most dynamic domestic production channel) is exemplary as a model for growth, but the channel is at a nascent stage of development with only two mills engaged in processing paddy, both of which started at the end of 2008. For Nigeria to produce an additional 1 million MT of high-quality rice, it will need to produce and process an extra 1.6 MT of paddy per annum, or a 50 percent increase in total Nigerian production, growing the value chain significantly. The implications are twofold:

- modern processing capacity will need to expand fifteen-fold over the next decade (i.e., another 30 large-scale mills will need to be developed); and

- farmers will need to become both more productive and more numerous to meet the supply requirements. There will need to be the equivalent of an additional 500,000 hectares of new high-yield production or, as an alternative, a large population of smallholders covering roughly 1 million hectares will need to double their yields (from about 1.5 MT per hectare to over 3 MT per hectare). The most likely result will be a combination of the two: hundreds of thousands of new farms entering into production as well as significant intensification driven by existing farmers' investments.

The experience from Olam and Veetee's new milling investments demonstrate that supply of high-quality, homogenous paddy is the most important immediate constraint, and that developing the farmers' capacity to provide this supply has required several years per farmer to achive the right levels of production. There are two main implications from this:

- First, farmer development will require significant investment and forethought on the part of the new private mills as well as the government. There is plentiful undeveloped Fadama land to expand onto, but some immediate gains can be made in upgrading existing lands with irrigation potential. Farmer development will be slower in the initial years, as the systems are being put in place, but will speed up as the models are developed and the supply of supporting service and input providers increases.

- Second, the mills will require a more gradual process of developing their total operations than might be expected—a new 50,000-ton mill will likely take five years to reach its final capacity of high-quality rice production.

UPGRADING STAGES

Reaching the goal will require a multi-staged process that starts with a very directed value chain development structure (phase one) and will gradually evolve into a more balanced development structure (phase two). While presented as two "phases," the process will develop at different speeds in different parts of the country.

Phase 1: The strategy starts with facilitating greater upstream investments in modern processing capacity through lead firms and developing contract/outgrower schemes by those lead firms (i.e., Olam, Veetee and others). Using the Olam example as a starting point, effective programs are needed to drive the supply of quality paddy to the mills. This will require a carefully managed approach during the early years, while high-quality paddy supply is still scarce.[32] The value chain lead firms will play a significant role in ensuring the delivery of key inputs to their outgrowers, tying the outgrowers into financial services and providing production advisory services.

However, it is in the interest of the rice mills to divest themselves from as many of these outgrower management functions as possible once there is a regular supply of inputs and advisory services. Future investments in developing outgrower schemes need to concentrate on developing market-driven systems for the coordination and management of the schemes, working in conjunction with the mills. A market for outgrower facilitation services would be viable if mills could understand and embrace the value proposition[33] that such facilitators would offer. However, the outgrower facilitators would need to be able to develop a valuable offer to mills and be capable of delivering on the services they advertise.

As larger agro-oriented companies realize that professionally managed, large-scale commercial paddy farms can be very profitable (especially if linked to quality milling), such investments will begin to appear, but any investments will have a multi-year time lag before large quantities of high-quality paddy can be produced.

Phase 2: As the demand for high-quality paddy from large mills demonstrates to producers the manner in which they can upgrade their production processes to collect greater revenue, two likely developments should be nurtured and catalyzed by a program that can develop the necessary linkages between the different actors (a market development facilitator):

- first, the ability of existing commercial agro-input dealers to craft and deliver on a value proposition that attractively markets their productivity and profitability-enhancing products and services (as described above)
- second, the creation of opportunities to foster effective cooperation that reduces high transaction costs, leading to a much broader uptake of inputs and support services as well as the introduction of new strategies to farmers for increasing their productivity and profitability

This second point could be achieved through at least three interventions:

- creating village-level order point structures for inputs that are managed by a local farmer that organizes purchases for the community

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[32] Care should be taken to avoid a mismatch between rice processing capacity and farmers' capacity to deliver high-quality paddy. If too much processing capacity is developed in advance of the supply, there is danger of the private mills behaving in a predatory manner against each other, stealing outgrowers' and contract farmers' output and causing disarray on the production side. If outgrower schemes are corrupted by too many opportunities for side-selling, they are likely to collapse before they reach sustainability. Planning the sites for any new mills must also be done with caution. Optimization of the production-milling equation requires the milling operation to be located next to the paddy production site so that energy is not wasted transporting paddy across long distances. There is widespread potential to produce high-quality paddy in many parts of Nigeria; substantial areas with vacant Fadama land are available for dedication to rice production in many states, so if significant new expansion is planned (as will be needed), the sites for production and milling should be carefully selected.

[33] A value proposition is the potential return to a farmer or mill from the services to be provided by a service provider. Service providers need to be able to clearly express this in order to get clients to buy into them.

- lead firm (mill)-directed channels with proper performance-based outgrower management
- upgrading for self-organized farmer groups—the focus or end result should not be formal organization, but should be benefits to members

Over time, the industry will actually be better-served by stronger producers who are incentivized to self-invest due to the opportunity to realize greater profits. This opportunity will be a product of more organized and efficient paddy production management and a shift of governance relations within the value chain to a more balanced, win-win, typology. Strong producer-driven organizations will enhance access to inputs and services (including finance) and have the potential to improve the farm-gate paddy prices that farmers can command through improved storage/finance combinations (i.e., initiation of warehouse receipt schemes).

With stronger producer organizations, increased vertical coordination and improved access to agro-inputs and production support services, the entire rice value chain will become more efficient, thereby reducing the cost of production and increasing the benefits to both farmers and consumers. The spillover benefits will increase with time and lead to increased upgrading of farmers and mills in channel three. Some of these new entrants will come out of channel two, but others may enter directly into channel three.

Concurrent with Phase 2: Policy Reform. A number of policies that run counter to the current philosophy within government will need to be devised, implemented, monitored and adjusted as necessary. Concurrent with phases one and two, it will be essential for FGN, state and local governments to gradually withdraw from heavy subsidization and direct delivery of agro-inputs and rice production support services. Some operational suggestions for improving the policy process include:

- fostering greater awareness and competition between states—highlighting good performance;
- increasing the type and number of structured (even regular) interactions between the private sector and government; and
- expanding the experience base for Nigerian officials to see other political systems that actually work with and facilitate private-sector development in agriculture.

Using this process, the following actions constitute key components of this policy upgrading phase:

- FGN and relevant state governments engage with and support the NESG Rice Alliance Network to focus on building the competitiveness of Nigeria's rice value chain.
- Based on the policies and goals laid out in the NRDS, FGN invests in the oversight and management capacity that is designed to closely monitor and coordinate implementation of the NRDS. Additionally, FGN and state governments take more seriously the need to improve the reliability of agricultural statistics. Analysts' capacity to deliver evidence-based policy recommendations is of great importance if Nigerian agricultural policymakers are to be held to account for the success or failure of specific policies such as the NRDS. This capacity could be built within the NESG Rice Alliance Network.
- Following a commercially focused model similar to the one employed by IFDC's fertilizer voucher program, FGN and state governments begin gradual withdrawal from their role as subsidizer and deliverer of key agro-inputs. Applying an incremental, voucher-based approach, FGN and state governments need to facilitate a shift in farmers' current perception that agro-inputs, including fertilizer and seed, are a public good. This will require a communications campaign in tandem with any voucher programs. Government withdrawal from involvement in providing and subsidizing tractors and other types of mechanization equipment can be

immediate since such programs are hardly functioning today. The government also needs to ensure that tractors are not provided to cooperatives that are unable to maintain them.

- The FGN gradually lowers import duties. The FGN's rationale for high import duties is to protect and stimulate domestic production. However, the protection has had no impact on channel two, and channel three is too small to take advantage of it. As the larger mills come online and build up their supply base of high-quality paddy, the government should gradually reduce the levels of protection. The effort to stimulate greater domestic competitiveness while reducing the level of protection will be more successful if the government can set tariff reduction targets in advance, clearly communicating its intentions to the private sector and giving companies an appropriate amount of time to prepare for more direct international competition.

IX. RECOMMENDATIONS TO USAID

This assignment was not an evaluation of the current USAID program, but can serve to provide some recommendations for ways to improve the implementation of its program to fit into a much larger strategic effort to have a significant impact on rice production in Nigeria. The recommendations below take into consideration USAID's current program and immediate resources, and make recommendations for how these can be applied more effectively to increase outreach and have greater impact on the development of the rice value chain.

Among its activities in support of the rice value chain, the MARKETS project is working quite effectively to learn more about opportunities to increase productivity by smallholder producers and to integrate them into viable commercial channels. The contract grower pilot program with Olam has provided a demonstration to prove that farmers can grow rice profitably in Nigeria, feeding into a value chain that can effectively compete with the higher-priced imported rice. The MARKETS project has introduced a package of practices to small farmers that yields increases in production to incentivize farmers to increase investment and upgrade their services. MARKETS has linked Olam with a financial institution and helped to generate commercial financing for farmer production activities, and Olam has been able to procure fertilizers and deliver them to farmers, as well as to link into agricultural mechanization services.[34] Olam is also paying competitive prices for quality paddy, which it is able to process into high-quality rice. By providing a managed value chain, which presents a technological package, ensures the delivery of quality inputs at the right times and guarantees a market for the outputs at a highly remunerative price, small farmers are incentivized to invest in rice production to guarantee the minimum quantities to the industrial rice mills.

While MARKETS is developing an apparently successful model, this process has been time consuming and expensive, it is still incomplete and the sustainability is not yet guaranteed. It has taken four years for USAID (through MARKETS) and Olam to develop roughly 10,000 contract farmers in three states. Olam has invested in a new mill (for $3 million) and a system to reach out to farmers, while USAID has invested close to $1 million in support services to develop the contract farmers and help them adopt the POP.[35] In order for this investment to pay off for the Nigerian people, it will be necessary to ensure the sustainability, as well as the ability to roll out this model across the country using market-driven systems.

MARKETS needs to look at the broader issues of how to develop a market-driven solution to the challenge of systematizing the support that the farmers need. Taking a longer-term, systemic perspective on the problem is necessary at several levels. First is to take into consideration the need for at least 30-50 rice mills, like Olam's Markurdi mill, with effective outgrower production to produce 1 million tons of high-quality rice per annum. Such production would be able to replace about one-third of current imports, but that will probably drop to 25 percent by the time the mills are online and producing. In order for the MARKETS experiences to have greater sustainability and impact, MARKETS' role should change from being a direct service provider into more of a market facilitator, identifying the

[34] Olam is able to purchase all of the fertilizer through the subsidized government programs and deliver it to the farmers as well as hire tractor hauling services at subsidized government rates. However, the calculations using market rates for inputs still show that the production is profitable.

[35] The three main forms of assistance include:

- Direct staff monitoring of the program—roughly two project staff nearly full time, plus travel expenses
- Contracting BDS providers to manage the support to the farmers in the target areas. These contracts are worth about $50,000 per state (currently servicing 3 states) per annum
- Paying premiums to selected staff of the local ADP to participate in the program (these are costs associated with their participation, but not their salaries). In Benue state, this includes 20 extension advisors at N12,000/month, 3 supervisors at 36,000/month, and the head of the ADP at 36,000/month. This total of N384,000 per month is paid over 10 months a year, equivalent to $25,600 per year.

missing pieces of the puzzle and the market failures that have prevented them and developing local organizations to fill that role. In this way, MARKETS can eventually lead the system to be self-sustaining.

Since MARKETS has demonstrated that the model can be profitable, Olam must be encouraged to take on more of the costs associated with its own system and prove that the pilot is a successful commercial model.

The second major challenge is to take the pilot to the next level: replication. MARKETS needs to determine how to roll out the pilot and to increase private investment into the services supporting the sector in order to make it more commercially driven. This will require significant additional work to understand the system as a whole and then address the systemic problems. While a quick value chain assessment is a start, it will need to be deepened. MARKETS can do this analysis during its final year to position USAID more strategically for the future.

Therefore, working within the overall context of developing a supply response to the import substitution opportunity, USAID should adjust their support services in the following major areas:

- **Broadening their support to other commercial millers.** Thus far, Olam has been the only milling investor interested in developing supply. However, with the new push to increase the investment in industrial milling by the FGN, USAID should actively market its lessons learned and development approach to the new investors that the FGN is recruiting. This will serve several purposes: to get greater buy-in to the overall strategy for growing the value chain; to shorten the learning curve for new investors; to enhance miller demand for extension services to introduce appropriate POPs to potential contract growers; and hopefully to limit predatory behavior by new millers that can have a negative impact on the sector as a whole.

- **Stimulating the commercial provision of extension services**. The Olam pilot has demonstrated the need for consistent supervision and follow-up with the new contract farmers for the first couple of years until they have firmly adopted the new practices. Under the current MARKETS approach, these services have been fully contracted by USAID and risk ending with the project. Since they are critical to the long-term growth of the sector, USAID should make a concentrated effort to develop the supply of such services as well as build the demand for the services (which should come primarily from the lead firms that will benefit from the better organization of the farmers). Note that the current efforts targeting the ADP staff to provide these services are not a long-term solution due to institutional constraints.

- **Strengthening commercially driven input supply systems to link with small farmers**. Following the upgrading strategy, the program needs to seek strategies to allow commercial service providers to gradually replace the supply of input services that is currently being provided by the lead firm.

- **Building capacity of member-driven producer groups to upgrade their ability to deliver greater benefits to their members.** The current program is concentrating on building organizations that serve as points of leverage for the lead firms, not on building the capacity of producer organizations to become more independent groups serving their members. While this is effective at present, over time (within the next ten years), the farmers will need their own representation to enable them to access the best services and markets for their products and to balance the governance of the value chain. This will require understanding the range of producer dynamics and mechanisms for linking farmers to appropriate services, as well as investment in training capacity for producer organizations.

- **Engaging more directly with the government on policy and strategy issues**. This is very challenging in Nigeria and results will not appear quickly, but if it is not addressed, other activities might be compromised. The NESG Rice Alliance is leading this effort for the private sector, but USAID should seek out opportunities to affect the development of the government strategy and orient it in a more realistic manner.

The FGN's new Rice Development Strategy has been a missed opportunity for bringing a commercial dynamic to growing the value chain in Nigeria; greater involvement by USAID in the process might be able to greatly impact the implementation of the strategy.

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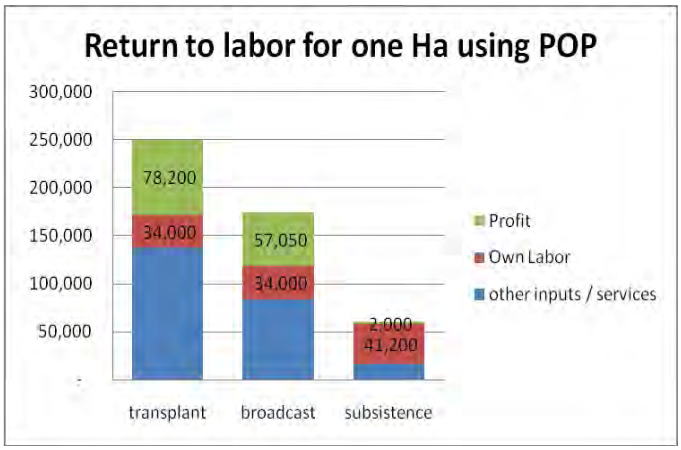
ANNEX A

COST AND MARGIN ANALYSIS OF RICE VALUE CHAIN

Production level. The costs of production vary greatly depending on the type of operation. A fully costed hectare using market rates for inputs and all labor and applying best practices (POP) that should yield 3.5-4 MT of paddy is nearly N130,000, or about N32,500 per MT, yielding a profit of about N70,000 per hectare. If the farmer is able to significantly reduce his or her labor costs, either by trading labor to other farms or using family members, the returns to the household increase. Applying a return to labor calculation, the results show that paddy production is still a very profitable business. Examples follow:

- A small farmer with 1-2 hectares doing most of the labor himself and applying best practices can achieve a yield of 3.5 MT per hectares and a return to labor of N79,050 (this increases to over N91,000 if there is no cost of land).
- A typical small farmer in channel 2, with a traditional low-input, low-yield approach, achieves a yield of 1.5 MT per hectare and gets a return on labor of about N40,000 (with no cost of land).
- A small farmer with more than 2 hectares taking a commercial approach to paddy production can achieve a yield of 3.5 MT per hectare and a profit of N45,050 per hectare (all labor and land costed).



The commercially oriented farmer, who is investing in the proper production technologies, can do very well simply by expanding the area under production (extensification).

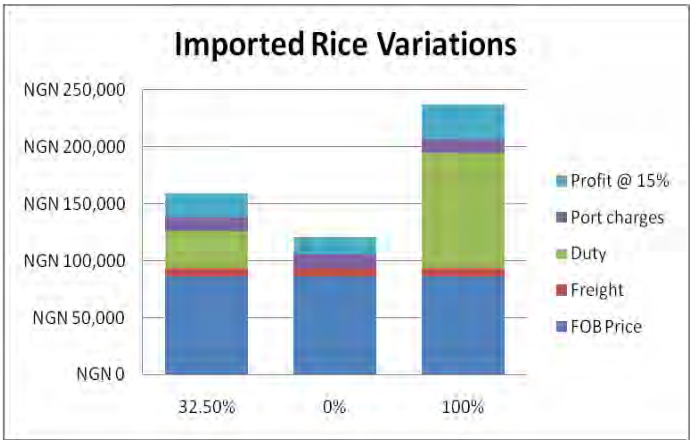
Given the relatively strong return to labor calculations, the main question is why farmers have not responded in greater numbers. This might be due to problems of access to the upgrading programs (contract growers), accessing more land and building greater confidence in the systems to incentivize upgrading. A number of other reasons, such as the importance of rice in the farmer's production strategy and other social reasons for not upgrading, need to be explored in greater depth.

Milling level. The profit margins for traditional milling are quite small. In Abakaliki, where heavy-duty mills produce a higher quality of rice (fewer broken grains), the milling rate is highest at N200 per bushel of milled rice (about N500 per 100-kg bag of paddy). Small mills, with less efficient conversion rates, will charge N250 for a 100-kg bag of paddy. A small mill can process up to 15 100-kg bags of paddy in a day for total sales of N3,000, from which electricity, diesel, spare parts and labor costs must be subtracted (note that the mills are mostly more than 20 years old and thus fully depreciated).

Parboiling is normally carried out very close to the milling. Calculations show that it costs between N300 and 500 per 100-kg bag of paddy, depending on the scale of processing (single bag versus a production line preparation).

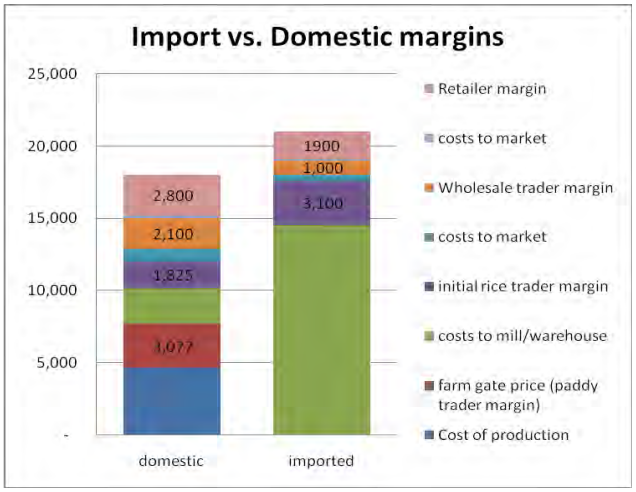
The de-stoning service costs N40 per bushel and is a viable business in concentrated milling clusters like Abakaliki.

Imported rice. The cost of imported rice is heavily dependent on the world market price and the duty. The price, landed in Lagos, is currently about $1,000 per ton for rice that costs $580 FOB Bangkok. The duty currently totals 32.5 percent and is charged on a fixed reference price FOB value, which is currently $685/MT, but can vary. The figure to the right shows the breakdown of costs, highlighting the significant impact of the 32.5 percent duty. The second column demonstrates the impact of no duty, while the third column shows the 100 percent duty that many in government would like to apply. The government has used duties as a way of protecting the market to enhance incentives for domestic production (with no success to date), but has also been able to reduce the duties during the time of worldwide crises to maintain a fairly constant domestic price.



Transportation. Transportation figures heavily into the cost structure for domestic rice. One of the interesting characteristics of rice processing in Nigeria, as noted above, is that the processing is concentrated in a few specific locations. These are not necessarily close to either the production or the markets, so the rice might need to travel (as paddy) for a day to reach the processing zone, and then travel for another day to get to the market. The transportation of paddy is clearly inefficient since it involves transporting 35 percent waste, but the processing clusters serve as good market points to bring together supply and demand (traders). Costs of transport vary somewhat by distance, but remain in the range of between N500 and N700 per bag for trips of more than 6 hours.

In addition to the normal transport cost, transporters need to pay extra for bribes and fees along the road. This varies by length of trip, but can average 15 percent of the transport cost (N100 for a N700 trip). Reducing the transport distance to the milling would reduce costs significantly (the equivalent of 12-15 percent of the price of milled rice at the mill).



Miscellaneous handling costs. Every time a bag of rice is picked up and moved, it attracts a cost. Loading paddy at the farm gate costs N40 per bag. Off-loading it at the mill (or parboiler) costs N30-40 per bag. Moving it to the mill from the parboiler costs N100 per bag, moving it from the mill to the truck, in a wheel barrow, costs N40 per bag, and loading it into the truck costs another N30 per bag. Once it reaches its destination, it is unloaded (N30) and transported by wheelbarrow (N40) to storage (N15) and finally moved to the market (N150).

The figure above presents a comparison between a 100-kg bag of rice grown in Taraba, milled in Abakaliki, and sold wholesale in Abuja (converted from paddy at 65 percent) compared to 100 kg of rice imported from Thailand. Simply looking at the margin analyses for each product, 54 percent of the end value for domestic rice is comprised of trader margins (initial paddy trader/grower, paddy to rice trader, rice wholesaler and rice retailer), compared to 29 percent from imported rice. The biggest margin is actually made at the paddy trade level, buying the rice at the farm and then holding it to sell to traders who take it to the mills. If farmers can hold onto the rice longer, they will capture more of this paddy trade margin. For the domestic rice, it is also important to note that about 75 percent of the other costs

associated with the rice value chain are service charges for production labor, loading and unloading, milling and parboiling, resulting in approximately 90 percent of the value added accruing to individuals.

The point of greatest margin in the domestic chain (channel two) is the initial paddy trader, who purchases it at the farm gate at harvest and is normally linked to the farmer with credit or other ties. This margin can increase significantly over the course of the year if the paddy trader has purchased it at harvest. A critical determinant is whether farmers have the operating capital to afford storing rice, and are thus able to capture greater benefits. In Bida, many of the paddy/rice traders actually perform the entire process of purchasing paddy at the farm gate, holding the paddy, then taking it through to milling and selling to the rice traders. In Kano, many of the large traders buy paddy and transport it to Kano to be stored, and then have it milled and sell the rice. In the producing areas that are distant from the major processing zones, the traders purchase and then store the paddy in the production zone until the paddy/rice traders come to purchase it and transport it to be milled and sold.

The price variations for domestic rice were not as great during the food crisis of 2008 as might have been expected because of the relationship between the price of imported rice and domestic rice. Since the government responded to the surge in world market prices by eliminating the 100 percent import duties, the local price for imported rice did not rise drastically. Therefore, since the local price of marketed rice is tied to the import price, there was relatively little variation in the price of domestic rice.

In channel four, Olam is paying a very high price for paddy delivered to the mill (N64,000/ton). In a rice equivalent, this is about N98,000, which is much higher than typical farmers pay. However, Olam markets the rice at N140,000 at the factory gate, and thus maintains a gross margin of about N42,000/ton ($280/ton), which covers milling costs. When Olam is operating at full capacity, this will result in gross margin of $5.6 million, which is largely sufficient to generate a reasonable profit.

The financial analysis shows that rice is a very profitable crop for all concerned. Initial indications are that even if the tariff protection is removed, efficiencies from better-organized value chain relationships will still keep production (farmers) and marketed rice (mills) profitable, especially if it is selling in the imported rice segment.

The importers, paddy producers, processors and the various marketing agents and middle men or women share in the roughly $5 billion industry. In the domestic rice industry, estimated at $2 billion, gross profit margins account for more than half of this value. The main problem with domestic rice remains that there are so many different people making their living from the production, processing, handling and marketing of rice that the amount being handled by any single individual is small. This is a major cause of the inefficiency of the sector and its lack of competitiveness. Increased efficiency would require generating greater scale at the different functional levels, which is what channel four is seeking to achieve.

ANNEX B

IRRIGATED LANDS[36]

During the oil boom of the 1970s, an investment program in support of public irrigation was launched. Public irrigation in the Nigerian context means schemes run either by River Basin Development Authorities (RBDAs) or by the states. The program included the construction of large dams and pumping stations, especially in the drier, northern part of the country. By 1990, 162 dams had been constructed with a total storage capacity sufficient to irrigate 725,000 hectares if developed. Many of these dams, however, were built with little or no infrastructure and the sites chosen did not always have sufficient irrigable areas close by. The schemes that were developed have not been fully brought into production or have been implemented with inappropriate infrastructure. By 2004, only about 20 percent of the area planned for public-sector irrigation had been developed, and only 32 percent of the developed area was being irrigated. The poor utilization of the developed irrigation area in the public irrigation sector can be attributed to a number of factors including: (i) the lack of a coherent irrigation subsector development policy and strategy; (ii) insufficient attention to management systems; (iii) inadequate funding (including poor cost recovery); (iv) high capital and operating costs; (v) inadequate farm support services; (vi) poor operation, repair and maintenance; (vii) a low level of project ownership acceptance by the direct beneficiaries; and (viii) uncertain financial and economic viability. Because of these lapses, a number of schemes have already deteriorated badly and are in urgent need of major renovation and repair, less than 20 years after their construction.

With irrigated land being less than one percent of the cultivated area, the contribution of irrigated agriculture to total crop production is small. In the 2003-2004 season, irrigated grain production contributed to 0.9 percent of the total grain production.

Semi-autonomous project management units manage federally owned and funded irrigation schemes. Those units usually consist of 3-4 departments such as Irrigation, Agriculture, Accounts, Stores and Workshops. A Project Manager who reports directly to the Managing Director of the RBDA concerned heads the units. Government policy is to subdivide schemes along the lines of one Water User Association (WUA) per distribution canal; thus, a WUA comprises 10-25 farmers. Responsibilities include operation and maintenance of the canal and its structure and adherence to water scheduling programs. A scheme management committee, for which each WUA elects a representative, then acts as the interface between the WUAs and RBDA or other authorities.

The NRDS identifies the following main constraints to improving irrigated lowland production:

- need for the rehabilitation of existing irrigation schemes and abandoned ones
- need for expansion of irrigation facilities in the long run
- need to improve yield from 3.0-3.5 tons per hectare compared to the potential of 7.0-9.0 tons per hectare
- alkalinity, salinity and nitrogen use efficiency, and iron micronutrient toxicity
- disease/pest management, especially of birds
- low-level mechanization
- non-involvement of farmers and farmer groups in the planning and implementation of irrigation schemes, especially areas related to maintenance

[36] This section draws on FAO's "Water Profile of Nigeria," 2008.

- need to privatize or lease the schemes to prospective investors for proper management in a Public Private Partnership (PPP) arrangement, with RBDAs, the states and Agricultural Development Programs; could collaborate with development partners to expand cooperative societies and farmer groups
- extreme temperatures
- low-input access, including credit
- migration and an ageing population with human risk factors like HIV/AIDS, malaria, etc.

ANNEX C

CONDITIONS REQUIRED FOR DEVELOPMENT AND STRENGTHENING OF AGRO-INPUT INDUSTRY

For the input industry to effectively deliver inputs to the rice producers it will have to:

- **Support year-round production.** The input industry needs to grow via marketing, promoting and building distribution capacity for appropriate equipment, varieties, chemicals and services that foster irrigated and mechanized farming for both commercial (i.e., structured irrigation schemes, tractors, harvester, etc.,) and emerging commercial farmers (i.e., motorized hand tillers, tilling services, spraying services, etc.,). The input industry cannot function on a one-season crop over the long term.

- **Facilitate financial flows.** Especially in the near-term, as banks are limited in their ability and willingness to service the agricultural sector, agro-input dealers will have to shift marketing and production/distribution tactics to meet financial flows within the rice production sector. This will be a moving target because production consists primarily of one crop per season and farmers will have lumpy income patterns during each year. This will require input firms to adjust their promotional activities to coincide with cash-rich times or internal (urban to rural) remittance flows. As rice producer associations become more established commercial agents, they will become more viable as prospective bank clients. Financial institutions can also employ extension and supervisory services to ensure loan repayment by village organizations.

- **Recognize different input requirements of different value chain channels.** Increasing segmentation within the rice industry will shift marketing and production/distribution tactics to target evolving market channels that could include low-grade parboiled rice for rural villages and towns, medium-quality parboiled rice for some rural towns and parts of larger urban centers, and higher-quality premium parboiled rice for urban centers. Channels for other specialty rice are also likely to present interesting opportunities (especially for smallholders) that can be better-suited for such high-value niche products. To meet the differing needs of these end markets, commercial sub-networks or channels will need to form around meeting these different needs, but knowledge flows and incentives will have to be aligned if farmers are to know what and how to produce and also understand the potential benefits of shifting production practices.

ANNEX D

AGRICULTURAL POLICIES THAT AFFECT RICE VALUE CHAIN[37]

The National Agricultural Seeds Decree of 1992	Nigeria has failed to develop a healthy seed industry. Consequently, Nigeria's farmers cannot access high-quality seed varieties in most crops, resulting in agricultural yields that are not internationally competitive. The National Seed Service was created in 1972 to produce improved seeds for certain crops (including rice) that would be provided at a 50 percent subsidized rate, but an overarching seed authority was not established until 1992 with the passage of the National Agricultural Seeds Decree. This remains the current law applicable to seeds. Although the Seeds Decree provided for the establishment of a National Agricultural Seeds Council to be responsible for the overall policy and monitoring of seed development and the seed industry in Nigeria, no such council existed in Nigeria until December 2007. Accordingly, regulation of seeds and the seed industry remains in its infancy. The current Seeds Decree purports to establish an extensive but reasonable regulatory system for the seed industry, although the law itself leaves much of the practical detail to be developed in subsequent regulations. The Seeds Council, according to the Decree, would be responsible for supervising committees also called for by the Decree, including the Crop Variety Registration and Release Committee, the Seeds Standards Committee, the Seed Industry and Skill Development Committee and the National Seed Service Unit. In 1994, National Seed Rules and Regulations were passed. While these Rules and Regulations detail certification and other regulatory processes, they are reportedly out of date and set to be replaced following passage of a new Seeds Decree. Revision of a draft Seeds Decree is currently underway at the National Agricultural Seeds Council, and is expected to be finalized in 2009. The IFDC provided the first draft in an attempt to develop a new Seeds Law that is consistent with the ECOWAS Regional Seed Harmonization Policy. According to the Seeds Council, the new law should promote greater autonomy in the seed sector and increase public-private partnerships. It will also create a council chaired by the private sector as part of a move towards increasing the role of the private sector in seed policy development and regulation. Today, most seed production and distribution is conducted by the public sector, and the Seeds Council is pushing policies that move these activities into the private sector and increase commercialization of these processes.
The National Fertilizer Policy of 2006	The primary objective of the policy is to "facilitate farmers' timely access to adequate quantity and quality of fertilizers at competitive but affordable prices." However, poor and untimely access to fertilizer remains a major concern for the country's farmers. The 2006 Policy addresses a variety of ways to meet its primary objective and a number of guiding principles. While the door is left open for potentially heavy government involvement, the Policy does specifically address what has, to date, been a fundamental weakness in the fertilizer sector—the uncompetitive private-sector

[37] This table draws on the work of IITA, "Agriculture in Nigeria" and Booz Allen Hamilton, "AGCLIR".

	fertilizer market resulting from excessive government interference. Several references are made to facilitating a competitive private sector, and the Policy specifically states that fertilizer prices should be determined by market forces. Indeed, there is some evidence that the move towards greater private-sector engagement is making some headway. A fertilizer subsidy voucher program is now being piloted in some states,[38] bringing the private-sector providers closer to the consumers. Such developments in implementation are promising, and the Policy allows for a move in this direction. However, the Policy does retain for the government certain domains that should be private-sector driven, such as research and development, which under the provisions of the policy remain "the primary responsibility of Government."
2001 Agricultural Policy	Includes the following broad objectives: • attainment of self-sufficiency in basic food commodities with particular reference to those which consume considerable shares of Nigeria's foreign exchange and for which the country has comparative advantage in local production • increase in production of agricultural raw materials to meet the growth of an expanding industrial sector • increase in production and processing of exportable commodities with a view to increasing their foreign exchange earning capacity • modernization of agricultural production, processing, storage and distribution through the infusion of improved technologies • creation of more agricultural and rural employment opportunities to increase the income of farmers and rural dwellers and to productively absorb an increasing labor force in the nation • establishment of appropriate institutions and creation of administrative organs to facilitate the integrated development and realization of the country's agricultural potential
2009 National Rice Development Strategy	The overarching goal of the NRDS is to double rice production in Nigeria by 2016. The Strategy views the rice value chain through a 3-stage lens: production, post-harvest processing and marketing. The NRDS says that "rice represents the best opportunity for Nigeria's reduction in food imports," yet later in the strategy three "problem trees" are presented that detail a total of 90 constraints that are currently preventing national self-sufficiency in rice production. The vision and scope section of the NRDS lays out the following goals: • double rice production by 2016 through intervention in input delivery, and empowerment of rice farmers through upgrading of their technical know-how • double government efforts in rice technology extension services • support private investors in establishment of modern rice processing facilities • provide functional irrigation facilities in the major rice production areas in the flood plains of major rivers (i.e. Niger, Benue, Kaduna, Ogun, Anambra, etc.) • provide through public-private partnerships rice production, processing

[38] IFDC is managing this program under the USAID MARKETS Program. The pilot states are Kano and Taraba.

	machinery and market linkage systems • establish durable price support mechanism for stable producer prices in order to sustain farmers' interest in rice production through the guaranteed minimum price mechanism
2009 National Food Security Strategy	The vision of the strategy is to ensure sustainable access, availability and affordability of quality food to all Nigerians and for Nigeria to become a significant net provider of food to the global community. The goals are to significantly improve Nigeria's agricultural productivity, expand and improve large-scale production, improve storage/ processing capacity as well as required infrastructure to achieve food stability, and derive over 50 percent of the nation's foreign exchange through agricultural exports."[39] For rice, the stated production target for 2008 was 3.4 million MT of paddy. The target for new area to be brought under cultivation was 300,000 hectares, and the strategic reserves target was 200,000 MT of paddy. Additionally, the following initiatives are laid out: • massive publicity and sensitization of farming communities through radio and road shows • engagement of private sector for value addition emphasis on production, processing and marketing • engagement of private sector to provide training and capacity building for the stakeholders • provide farm power and machinery for land clearing and preparation • secure guaranteed minimum price for rice paddy • FGN price support policy for seeds/ seedlings at 50 percent • FGN price support for agrochemicals and fertilizer at 25 percent • FGN price support for tractors and processing equipment at 25 percent • attracting private-sector participation using credit support and financial incentives through FGN Bond • engage private sector to set up commercial farms • develop farm land cadastral survey system that will improve access to credit • build and maintain irrigation infrastructure for farm land • support the National Cereal Research Institute for genetic improvement of rice
National Economic Empowerment and Development Strategy (NEEDS)	Aims to strengthen the competitiveness of national industries by increasing local content and value added. In the agricultural sector (which represents 26 percent of GDP and 70 percent of the labor force) the goal is to guarantee food security, self-sufficiency and diversification of exports.
Presidential Initiative on Increased Rice Production Processing and Export	This 2003 initiative sought to reduce Nigeria's reliance on rice imports by stimulating domestic production and offering new incentives for corporate investments in value chain functions (i.e. processing) that would increase domestic value-added. The 4-point initiative focused on production, inputs, and crop protection; irrigation and land development; processing and marketing; and program management.

[39] Nigeria National Food Security Strategy 2009.

ANNEX E

THE NESG RICE NETWORK

Still at the nascent stages of development, the Network's agenda for 2009 includes:

- creating awareness around the Network to facilitate membership enlargement;
- building an informational portal on the NESG website;
- holding a workshop entitled "Upgrading Indigenous Rice Brands and Value Chains for Rice Self-Sufficiency and Poverty Reduction";
- writing a quarterly "NESG Rice Policy Brief";
- conducting an "investment promotion drive" via study tours to Thailand, China, and Europe; and
- initiating policy dialogue with the Agricultural Committees of both Houses and the National Assembly.

Membership profile of the NESG Rice Network

	Categories & No	Organizations Represented	Role in Value Chain
1.	Rice Farmers (rep by association- Umbrella body)	Rice Farmers Association of Nigeria HQ- Abuja (representing several thousands of rice farmers on the board of the Network	Rice cultivation, paddy production
2.	Rice Processors (7)	Olam, Veetee Rice, Dana Foods, Isiaku Rabiu Group, Stallion, Ebony Agro Ltd	Local polishing of imported brown rice; and processing of local paddy into finished rice
3.	Rice Importers (6)	Churchgate, Milan, Stallion, Olam, Veetee Rice, Dana Foods	Import finished rice and sell through distribution network
4.	Donor projects (3)	PrOpCom, USAID/MARKETS, Oxfam	Support development and upgrading of the local rice value chain
5.	NGOs (3)	New Nigeria Foundation (NNF), etc	Undertake poverty reduction programs
6.	Fed. Ministries and parastatals (6)	National planning Com., Fed Min of Agric & WR, Fed Min of Com, NEPC, Nig Customs Serv.	Policy making at central level; implementation of federal government programs for the sector
7.	Input supply companies (6)	Notore Chemicals, Riggs Ind., Vortex Technology, Erste Graceland Ltd, WAP Distributors	Provide services and products to chain operators
8.	State Ministries and Parastatals	None yet	Policy formulation and program implementation at the state level
9.	Research Institutes (1)	WARDA	Rice research and development

ANNEX F

RESEARCHERS' CONTACT LIST FROM FIELD WORK IN NIGERIA

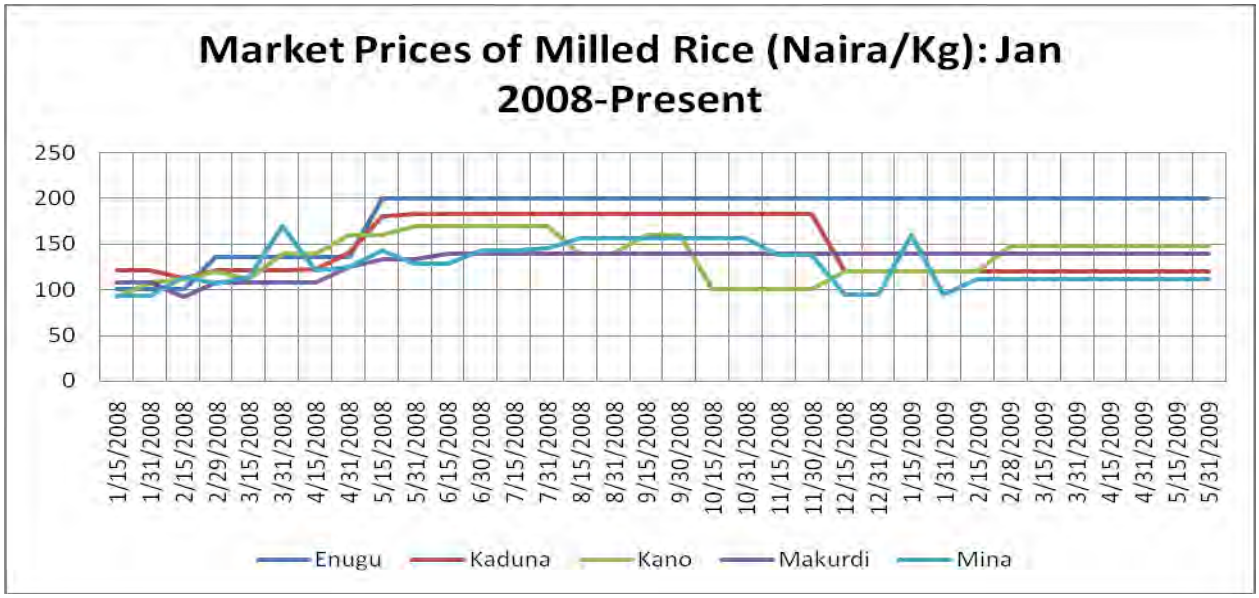
Name	Organization	Email Address	Mobile Phone #
Julian Peach	DFID PrOpCom Program Manager	jpeach@propcom.org	
Mike Bassey	World Bank MSME Program BDS Specialist	mbassey@msme-nigeria.org	[redacted]
Timothy Prewitt	USAID MARKETS Program, Managing Director	tprewitt@nigeriamarkets.org	[redacted]
Niels Hanssens	USAID MARKETS Program, Director of Technical Services	nhanssens@nigeriamarkets.org	[redacted]
Dr. Tom Timberg	World Bank MSME Program, Senior Access to Finance Specialist	ttimberg@msme-nigeria.org	[redacted]
Scott Wallace	IFDC Nigeria Country Representative	swallace@ifdc.org	[redacted]
Henry Ekpiken	IFDC Project Leader	ehenry@ifdc.org	[redacted]
Salau Sheu	IFPRI Ag Policy Support Facility	s.salau@cgiar.org	[redacted]
Mohammed Umar Kura	Managing Director of Kano State Ag and Rural Dev. Auth.	knarda@yahoo.com	[redacted]
Mark Ukwungwu	Director of National Cereals Research Institute	ukwungwu@yahoo.com	[redacted]
Dr. Emmanuel Abo	Assistant Director of National Cereals Research Institute	Mebo2002@yahoo.com	[redacted]
Prof. Lawrence Ega	National Program for Food Security, Head of Community Development	egalaw@yahoo.com	[redacted]
Dr. Salisu Ingawa	National Food Reserve Agency (NFRA),	saingawa@nfraagric.org, saingawa@yahoo.com	[redacted]

	Executive Director		
Elesa Bitrus Yakubu	NFRA Deputy Director	byelesa@yahoo.com	[redacted]
MAA Adewuyi	Fed Ministry of Agric and Water Resources (FMAWR), Director of Agro-Processing and Marketing	mosesaaadewuyi@yahoo.com	[redacted]
M.L. Gwadabe	The Seed Project Company, President	seedprojectcoy@yahoo.com	[redacted]
Col. Edwin Jando	Managing Director of FEDMENA Nigeria		[redacted]
Ameh Michael O.	Olam Nigeia	Nojey3@yahoo.com	[redacted]
David Sturza	EcoVentures Int'l, Research Associate	david@eco-ventures.org	[redacted]
Pei Chang	EcoVentures Int'l, Research Associate	pei@eco-ventures.org	[redacted]

ANNEX G

RICE PRICES (NAIRA/KG) ACROSS NIGERIA, 2008-PRESENT[40]

The graph below shows the price fluctuation for local rice in the market over the past 18 months. Across the five states visited for the purpose of this study, the authors observed an approach to retail pricing that virtually pegged the price points of domestic rice to the price points of imported rice within a 20 percent band. This is quite rational market behavior. If the price of imported rice drops, the price of local rice also drops at the market level.



[40] Nigeria National Food Reserve Agency, 2008/9.

ANNEX H

PROFILE OF FOOD INSECURE POPULATIONS IN NIGERIA

The Sudano-Sahelian region (in the extreme north of Nigeria covering Kebbi, Sokoto, Zamfara, Katsina, Kano, Jigawa, Borno, and Yobe states) is usually drought-prone with average annual rainfall of about 600mm and is exposed to fast-encroaching desertification and soil erosion. These conditions sometimes result in food production deficits, which reduce household food reserves to about 5-6 months. These populations are highly dependent on cereals as a source of food, with diets relatively lacking in diversity. These factors coupled with poor household practices have led to record high levels of malnutrition, leading to stunted and underweight children.

From the perspective of pastoralists, increasing urbanization and high population growth is resulting in reduced grazing land. This growing pressure of land results in high conflict potentials and substantial cases of conflicts between farmers and herders. Inadequate supports for livestock development contribute to the deterioration of the sources of income of pastoral households who have to spend a substantial amount of money for veterinary care. Reduction of milk intake during the lean period when fodder and water are scarce translates into the highest levels of malnutrition among pastoralist children under the age of five.

High population density, rapid urbanization and substantial land fragmentation in the face of limited land resources makes access to land difficult and expensive for smallholder farmers in southern Nigeria. This situation coupled with perennial soil erosion, soil infertility, poor access to fertilizers and other inputs, and poor rural infrastructure translates to low productivity, food production deficits and household food insecurity, worsened by poor market systems. Poor market systems are caused by the lack of competitiveness of export crops due to high production costs, lack of storage facilities, frequent shifts in production, and poor road, communication, power and water services.

ANNEX I

PRICE OF RICE

Price of Rice, landed Lagos with 32.5% duties				
			$	Naira
Exchange rate		148.00		
FOB	$ / T		$ 580.00	
Freight	$ / T		$ 50.00	
C&F			$ 630.00	
Customs valuation	$ / T	$ 685.00		
Duty		32.50%	$ 222.63	
Total			$ 852.63	N 126,189
Shipping agency charges	$ / T	$ 17.00		N 2,516
Clearing charges	$ / T	$ 3.00		N444
Transportation	$ / T	$ 50.00		N 7,400
Other costs	$ / T	$ 10.00		N 1,480
Total landed at Lagos warehouse			$ 932.63	N138,029
Price per 50 kg bag			$ 46.63	N 6,901