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VALUE CHAIN ASSESSMENT REPORT: RICE

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DISCLAIMER

The authors' views expressed in this publication do not necessarily reflect the views of the United States Agency for International Development (USAID) or the United States Government.

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ACRONYMS

ACTE	Africa Competitiveness and Trade Expansion Initiative
AGIR	Global Alliance for Resilience Initiative
AGRA	Alliance for a Green Revolution in Africa
ANARICI	<i>Association Nationale des Riziculteurs de la Côte d'Ivoire</i>
APRAO	<i>Amélioration de la Productivité du Riz en Afrique de l'Ouest</i>
ATP	Agribusiness and Trade Promotion project
BOAD	<i>Banque Ouest Africaine de Développement</i>
CARD	Coalition for Africa Rice Development
CCR-B	<i>Conseil de Concertation des Riziculteurs du Benin</i>
CGIAR	Consultative Group on International Agricultural Research
CILSS	<i>Comité Permanent Inter-Etats de Lutte contre la Sécheresse dans le Sahel</i>
CIR-B	<i>Comité Interprofessionnel de Riz du Burkina</i>
CORAF/WECARD	<i>Conseil Ouest et Centre Africain pour la Recherche et le Développement Agricoles/</i> West and Central African Council for Agricultural Research and Development
CPC	<i>Coordination des Professionnels Céréaliers du Togo</i>
EAGC	Eastern Africa Grain Council
E-ATP	Expanded Agribusiness and Trade Promotion project
EBID	ECOWAS Bank for Investment and Development
ECOWAP	ECOWAS Agricultural Policy
ECOWAS	Economic Community of West African States
ETD	<i>Entreprise Territoire et Développement</i>
FAO	Food and Agriculture Organization
FTF	Feed the Future

FUCOPRI	<i>Fédération des Coopératives des Producteurs de Riz</i>
FUPRO	<i>Fédération des Unions de Producteurs Agricoles</i>
GGC	Ghana Grain Council
GRIB	Ghana Rice Inter-professional Body
JICA	Japan International Cooperation Agency
LDC	Louis Dreyfus Commodities
MIS	Market information system
MSME	Micro-, small, or medium enterprise
mt	Metric ton
NAFASO	<i>Neema Agricole du Faso</i>
NGO	Nongovernmental organization
PAU	<i>Politique Agricole de l'UEMOA</i>
PPAAO	<i>Projet de Productivité Agricole en Afrique de l'Ouest</i>
RCA	Revealed comparative advantage
ReSAKSS	Regional Strategic Analysis and Knowledge Support System
RIFAN	Rice Farmers Association of Nigeria
RINI	<i>Riz du Niger</i>
ROPPA	<i>Réseau des Organisations des Producteurs Agricole</i>
SRI	System of rice intensification
SWOT	Strengths, weakness, opportunities, and threats
TEC	Common external tariff
UCOVISA	<i>Union des Coopératives du Vivrier des Savannes</i>
UDP	Urea deep placement
UEMOA	<i>Union Economique et Monétaire Ouest Africaine</i>
UGER-B	<i>Union des Groupements des Etuveuses de Riz de Bama</i>
USAID	United States Agency for International Development

USDA	United States Department of Agriculture
VAT	Value-added tax
WAAPP	West Africa Agricultural Productivity Program
WAGN	West Africa Grain Network
WFP	World Food Programme
WRS	Warehouse receipt system

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I. INTRODUCTION AND BACKGROUND

I.1 RICE VALUE CHAIN

This report focuses on the rice value chain in the West Africa region, within the framework of the recently launched West Africa Trade Hub and African Partners Network. It summarizes the current structure, competitiveness, socio-economic importance, and dynamics of the rice value chain in the region. The report briefly describes the key challenges and growth options facing the value chain and suggests strategic directions that will lead to sustainable growth and competitive upgrading of the value chain. The objectives are to reduce poverty, improve nutrition, reduce the vulnerability of West Africa's supply of rice, and increase economic benefits. Support provided by the Trade Hub to this value chain would contribute to key Feed the Future (FTF) objectives at the regional level.

I.2 VALUE CHAIN ASSESSMENT

Following the submission of a Value Chain Selection Report, the Trade Hub is producing a set of Value Chain Assessment Reports. During May 2014, the project carried out assessments of each value chain that the selection report recommended for targeted support from the Trade Hub. The assessments are the second step in planning activities for the project.

The Value Chain Selection Report provides a brief overview of each value chain; the assessment reports offer deeper perspectives about the current status, structure, performance, and challenges of the value chain. They update previously available information where possible. Based on this information and analysis, they recommend a vision and upgrading strategy for each value chain, and outline possible support roles for the Trade Hub in helping value chain stakeholders achieve their strategy.

As the first opportunity for the Trade Hub team to resume interacting with industry stakeholders and to begin identifying lead firms and areas where the project can have a positive impact, the value chain selection and assessment process also provides an initial basis for dialogue, brainstorming, and planning with key sector and value chain stakeholders. This phase, nonetheless, provides only a brief glimpse of each value chain and serves as a vehicle to commence discussion and idea-sharing with partners. Given the very limited time that was available for this process, the assessments do not constitute detailed value chain analyses.

I.3 ABOUT THE TRADE HUB AND AFRICAN PARTNERS NETWORK

USAID/West Africa's strategic goal is to support the emergence of a politically stable and economically prosperous West Africa. The Trade Hub's goals are to promote increased regional trade in key agricultural commodities (an FTF goal) and to reduce poverty through value-added exports (a goal of the Africa Competitiveness and Trade Expansion Initiative, known as ACTE).

The overall objective of the Trade Hub and African Partners Network is to increase Africa's share of world trade by increasing exports at a faster rate than the rate of growth in overall trade, and by improving West Africa's international private sector competitiveness in targeted value chains other than extractive industries.

The project will achieve two intermediate results: 1) improve the private sector capacity of the region's farmers and firms by addressing constraints to targeted value chains; and 2) improve the business enabling environment by addressing economy-wide constraints such as the transport and trade barriers that affect the efficiency of the region's ports, corridors, and borders.

At its heart, USAID/West Africa's Trade Hub and African Partners Network is a capacity building effort that will entail working with several key groups of African partners. The project's focus will be on developing associations and regional alliances that can act independently from donor support and take on a greater leadership role in promoting reforms, attracting buyers and investors, and adopting improved practices. The project will also work with individual companies that have a regional scope and could serve as lead firms in targeted value chains.

The Trade Hub will achieve its objectives by improving the private sector competitiveness of certain value chains. Based on the initial assessments made in USAID/West Africa's Feed the Future Multi-Year Strategic Plan, five value chains were pre-selected for the project: rice, maize, millet/sorghum, livestock (cattle), and livestock (sheep and goats). They were selected based on the following criteria: importance to intra-regional trade, high potential for value addition, production by a large number of stakeholders, and synergies with other supported value chains.

The Trade Hub team also examined the development potential of a number of value-added value chains and selected several for possible inclusion in the project's portfolio. This selection was based on six high-level criteria:

1. Potential to increase trade
2. Potential to create jobs
3. Potential to attract investments (including from the U.S.)
4. Number of households participating
5. Extent of geographic dispersal in West Africa
6. Current level of exports to global markets

The assessment phase thus focuses on the following short list of value chains:

FTF Regional Value chains:

- Maize
- Millet-Sorghum
- Rice
- Cattle
- Small ruminants

Value-added Global Value chains:¹

- Apparel
- Cashew
- Honey
- Mango (and possibly other cut fruits/vegetables)
- Sesame
- Shea

West Africa is on the verge of a transformative change—if it can create a new dynamic for intra-regional and export trade. At present, intra-regional trade is inefficient, characterized by unpredictable distortions and uncompetitive practices, and subject to overly restrictive regulatory regimes. West African exports have limited success in the global marketplace due to poor quality, inconsistent supply, and high delivery prices, which can be traced back to the absence of economies of scale, high transaction costs, and a poor enabling environment.

The Trade Hub and African Partners Network aims to promote broader, more sustainable growth by improving both private sector capacity and the policies, rules, and practices that govern regional and external trade. This will achieve sustainable and measurable increases in regional and international exports, jobs, and investment by strengthening vertical and horizontal integration within value chains, assisting representative associations to become more effective and inclusive, and improving the enabling environment for trade. The project will also mount a cross-cutting effort to increase the professionalism of all major participants by providing role-specific competency training, facilitating access to modern technologies, and improving market linkages. The Trade Hub will:

- **Leverage and strengthen already-identified or new private sector and public sector partnerships for commercial and development activities.**
- **Target the highest-impact opportunities in the value chains and policy regimes, to alleviate specific constraints hindering private sector growth.** The cornerstone of our structured approach to value chain development is identifying, in collaboration with our for-profit value chain partners and our public and nongovernmental organization (NGO) partners, where high-impact change can be achieved to maximize the return on project resources. Our trade and transport enabling environment staff will target specific policy and regulatory constraints which, once changed, will open up regional and external markets, reduce seasonal blockages, lower supply chain friction, and encourage trade-based investment and growth. They will work closely with stakeholders to advocate and enforce reforms.

The Trade Hub's higher-level results targets are summarized in Table I on the following page.

¹ The home décor value and fashion chain was handled differently. Only a limited Trade Hub initiative is recommended for home décor and fashion. An assessment was not conducted for this value chain, since it was no longer considered for a core Trade Hub focus.

Table 1: Highest Outcome-Level Results

Results	Through Year 3	Through Year 5
Increase in the value of global and regional transactions, on average, in targeted sectors of livestock, grains, and value-added products in West Africa	30%	50%
Creation of new jobs in Trade Hub-assisted West African firms	15,000	23,000
Facilitation of new investment in targeted sectors	\$62.5m	\$102.5m

Because different partners have different needs and levels of maturity, the project will tailor upgrading activities to each partner. We have recommended and will select value chains that offer opportunities to substantially contribute to achieving these objectives. We will choose value chains that can benefit from Trade Hub-supported activities such as:

- Improved buyer-seller intermediation
- Expanded use of grades and standards
- Increased access to and use of market information
- Increased access to and use of financial services
- More competitive transport and logistics enabling environment
- Reduced legal and regulatory barriers to trade

2. METHODOLOGY

Value chain assessment is the second of three phases that will lead to agreement on the Trade Hub’s target value chains:

1. Phase I: Select (recommend) value-added value chains
2. Phase II: Assess selected value chains
3. Phase III: Vet and obtain feedback, leading to confirmed selection

Eleven separate Value Chain Assessment Reports—one for each value chain—present the results of the project’s assessments.

As part of the research for the assessment reports, subject matter experts collected and updated data and trend information relevant to each of the value chains. The value chain assessments use a common set of criteria to describe the short-listed value chains and update information about them. In contrast to the selection process, which used subjective measures of only certain criteria based on expert opinion, the assessment process utilized the full set of criteria, quantifying them as much as possible. Based on this analysis, the reports discuss strategic approaches that could be supported by the Trade Hub to achieve the value chain’s vision.

Existing value chain studies and their conclusions were strongly considered in the assessments; the Trade Hub team held meetings and phone/Internet discussions with knowledgeable stakeholders.² The assessment team also began to analyze and discuss with stakeholders the opportunities and challenges facing each value chain and to make initial proposals for an upgrading strategy. If the stakeholders and the Trade Hub are able to identify a clear path for upgrading the value chain, it is more likely that the value chain will be ultimately included in the project’s set of focus value chains.

2.1 VALUE CHAIN ASSESSMENT PROCESS AND SUBSEQUENT STEPS

Table 2: Steps in Value Chain Assessment and Final Selection

Task	Method
Assess short-listed value chains	Assess the five preselected value chains and the other short-listed value chains against a full set of criteria through desk studies, review of existing value chains studies, and key informant interviews with members of partner network
Obtain USAID/West Africa’s feedback on Value Chain Selection Report	Review Value Chain Selection Report; meet with Value Chain Development Specialist and value chain team
Submit Value Chain Assessment Reports	Assess all VCs, obtaining data and information through value chain studies, desk research, and key informant interviews; include discussion of potential value chain vision, upgrading strategy, and Trade Hub interventions

² Given time constraints, we did not collect primary market data from the field or hold extensive interviews with a full roster of key informants.

Task	Method
Prepare facilitation guide for value chain stakeholder vetting	Based on the assessments, prepare summary presentation and process for vetting value chains
Vet value chain selection and assessment with stakeholders	Hold session within Project Partners Kick-off Workshop with Trade Hub stakeholders
Refine value chain selection and assessment, based on stakeholder feedback and suggestions	Continue interacting with key stakeholders and USAID as needed

The final selection will only take place after the Project Partners Kick-Off Workshop, which will be held on or about day 120 of the project (July 15, 2014). This workshop will include a stakeholder vetting of the value chain selection and assessments. Stakeholders will have the opportunity to draw their own conclusions about the short-listed value chains and the implied conclusions of the value chain assessments. The final selection will occur after this workshop, and will take into account the stakeholders' feedback.

2.2 SOURCES OF INFORMATION

The team obtained data and information for this value chain assessment through:

- Desk research from value chain analyses, studies, reports, and web-based material (see Annex 1)
- Meetings and interviews with key stakeholders in Accra, Ghana, and Ouagadougou, Burkina Faso, including interview includes farmers, farmers' organizations, processors, and partner organizations (see Annex 2)
- Phone calls, Skype conversations, and interviews with members of the West Africa Grains Network (WAGN) in their home countries (see Annex 2)
- Interviews with WAGN members from Benin, Burkina Faso, Ghana, and Senegal who came to Accra for a WAGN and partners meeting (see Annex 2)

2.3 DATA LIMITATIONS

The rice value chain does not have data and market information related to rice produced within the region. Rice data generated by the USAID-funded Expanded Agribusiness and Trade Promotion (E-ATP) project and the *Comité Permanent Inter-Etats de Lutte contre la Sécheresse dans le Sahel* (CILSS) concern only trade along selected corridors.

3. DESCRIPTION OF THE VALUE CHAIN

3.1 PRODUCTS INCLUDED IN THE VALUE CHAIN

This report is an assessment of the rice value chain in West Africa. The rice produced in the region can be divided into three categories: paddy rice, white rice, and parboiled rice. In addition, rice by-products are sold for animal feed. But in practice, only parboiled rice is subject to intra-regional trade. This product has developed significant demand in the region, especially in the urban areas (rice is a product whose consumption increases with increases in household income). Therefore, this report will focus mainly on parboiled rice (which is also processed locally as an example of value – added). The share of paddy rice and white rice in intra-regional trade remains limited and mostly informal.

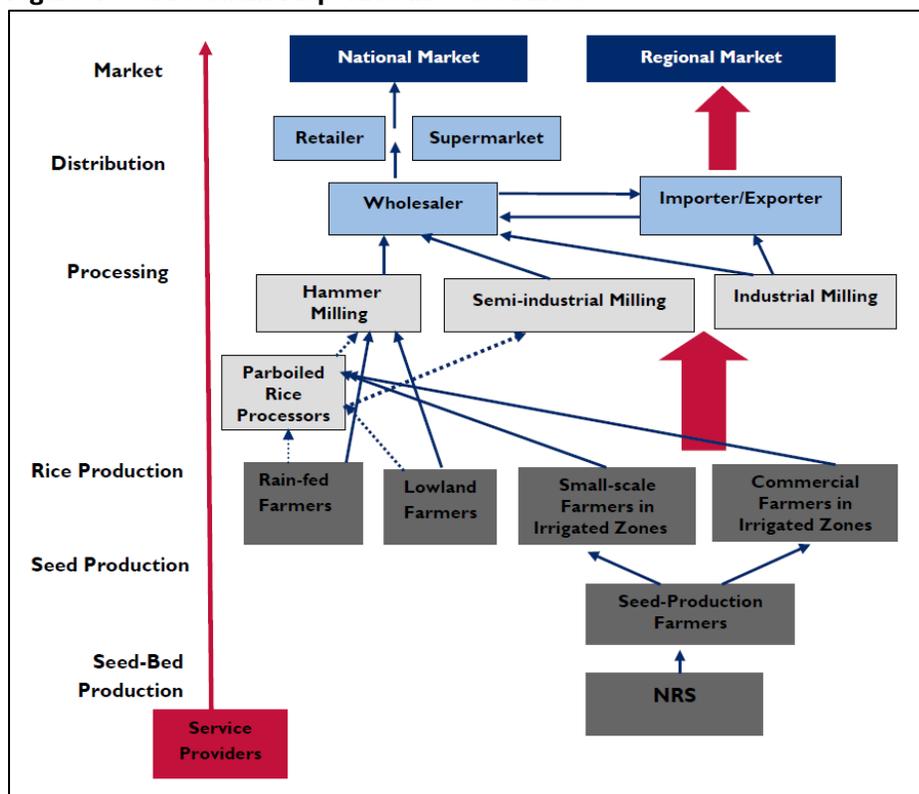
- Paddy rice: is the rice harvest from farms that is not processed at any commercial level. The paddy rice can be sold to the traders, processors, or aggregators. Sometimes, farmers processed the rice themselves before selling.
- White rice: processed paddy rice the husk is debarred and the brown rice polished. The white rice is essentially for domestic consumption. Imported rice is in large part white rice.
- Parboiled rice: the paddy rice goes through a process (washing, drying, soaking in hot water, second washing and drying, rice steaming, drying, hulling, and packaging). This process gives to the rice some organoleptic qualities, and best quality of commercial rice.
- By-products: three types: (i) broken rice sold cheaper for both human and animal consumption, (ii) rice bran is used in animal feeding especially in poultry, livestock, and small ruminants fattening, (iii) rice husk: is used in poultry industry. Recently, it is used as fuel to steam the paddy rice in the parboiled processing.

As discussed below in this assessment, governments in the region import significant amounts of rice to balance national food basket needs, especially when local production levels fall below targets. Much of the rice produced in the region takes advantage of irrigation systems and/or is cultivated near existing water sources such as rivers and lowlands. Improved varieties of rice have been developed in collaboration with national research systems; most of these improved varieties are used by the commercial rice sector, not for subsistence farming systems which rely on traditional varieties.

3.2 RICE VALUE CHAIN MAP

The rice value chain is characterized by interactions among actors both horizontally and vertically, as shown in value chain map in Figure 1 on the following page.

Figure 1: Value Chain Map: Rice in West Africa



3.3 PRODUCT FLOW MAP

The main identified cross-border flows for local (parboiled) rice are shown in the map in Figure 2 below.

Figure 2: Product Flow Map: Rice Value Chain

Origin	Transit	End Market
Burkina Faso (Bama)	Bamako	Guinea
Benin (south)		Nigeria
Mali (Segou)		Guinea
Senegal		Mauritania

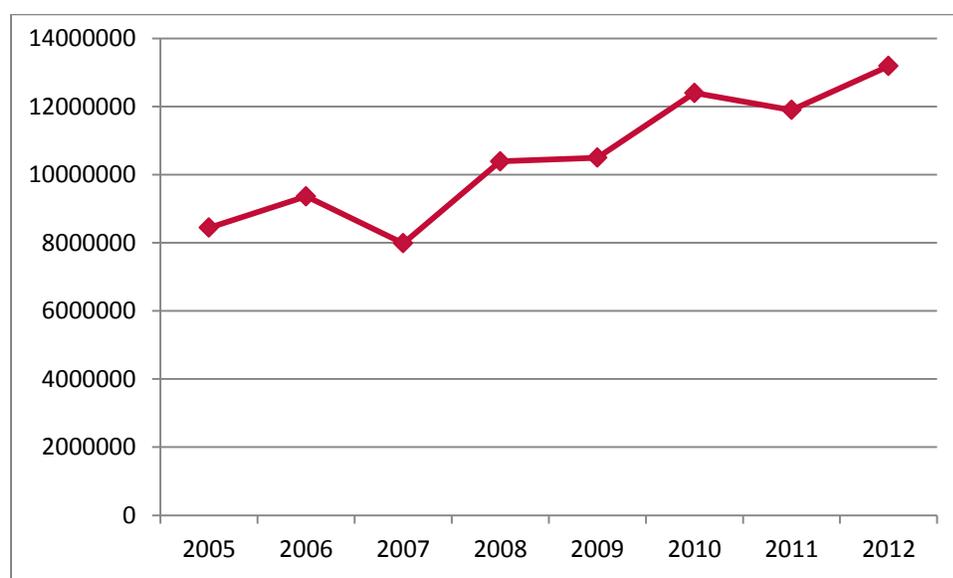
3.4 RICE DATA AND INFORMATION

In 2005, the region produced 8.44 million metric tons (mt) of rice. The next year the production increased to 9.37 million mt, before dropping to 7.98 million mt in 2007. Production increased in each of the next five years. Table 3 and Figure 1 below present data on this production.

Table 3: Rice Production (in metric tons)

2005	2006	2007	2008	2009	2010	2011	2012
8,440,928	9,36,5079	7,984,244	10,390,622	10,497,828	12,397,392	11,900,504	13,190,062

Source: FAOSTAT

Figure 3: Rice Production in West Africa (in metric tons)

3.5 MAIN ACTORS IN THE VALUE CHAIN

3.5.1 DESCRIPTION OF THE VALUE CHAIN ACTORS

3.5.1.1 Lead Firms

Some of the region's lead firms in production, processing and trade are presented in Table 4.

Table 4: Lead Firms in Rice Value Chain, Identified Under ATP Project

Name	Level(s) in the Value Chain	Country
Union des Groupements des Etuveuses de Riz de Bama (UGER-B)	Processing and trade	Burkina Faso
Conseil de Concertation des Riziculteurs du Benin (CCR-B)	Production, processing, and trade	Benin
Single Mothers Association	Processing and trade	Ghana
Sokimex (Koama Industries)	Milling, trade, milling services provider	Burkina Faso
Velegda Group	Trade	Nigeria
IRS Mills	Milling	Nigeria
Ets Terra	Trade	Burkina Faso

<i>Entreprise Territoire et Développement (ETD)</i>	Trade in paddy rice and milled rice	Togo
<i>Union des Coopératives du Vivrier des Savannes (UCOVISA)</i>	Trade	Côte d'Ivoire
<i>Coordination des Professionnels Céréaliers du Togo (CPC)</i>	Trade	Togo

Traders have begun to invest vertically downstream in the rice value chain in West Africa. They are involved in processing and marketing. Examples include Sokimex in Burkina Faso (processing) and the Velegda Group (marketing). As nascent lead firms in Ghana, there are GADCO (production and processing of rice) and Finatrade (marketing). In Côte d'Ivoire, the trading group Louis Dreyfus Commodities (LDC) has started a project to cultivate paddy in the north. It plans to invest \$60 million. The project will produce 300,000 mt of paddy rice per year on lands sized between 100,000 and 200,000 hectares (ha). In addition, the Olam and Mimran companies (also in Côte d'Ivoire) are about to start a commercial farm with about 150,000 ha planted with rice. During the project's first year, the Trade Hub will identify other operators with real potential to generate investments and exports and create jobs.

3.5.1.2 Micro-, Small, and Medium Enterprises

While there are some major, large actors among rice value chain firms, most are micro-, small, and medium enterprises (MSMEs). These entities work in every link along the value chain: inputs supply, production, processing, and trading. Individually owned firms engage in processing for both human consumption and animal feed, especially poultry. Women are very active in rice processing for animal feed.

3.5.1.3 Other Actors and Stakeholders

Seventy percent of rice farmers in West Africa are small, owning less than one hectare. Another 25 percent are medium-scale farmers who own one to three hectares. The 5 percent that are large commercial farmers are those owning more than three hectares. The rice value chain operates with clearly established, vertically connected channels. The chain of players comprises farmers, aggregators or local buying agents, wholesale dealers, suppliers, urban grain markets, processors, retail sellers, and wholesale end markets. The value chain is supported by a large number of stakeholders from the public sector, as well as private organizations and donor-supported technical assistance projects.

Rice milling is dominated by hammer milling, which produces low-quality rice. Rice is sold in bulk without packaging. Trade is handled by micro- and small traders, especially in villages and semi-urban zones.

3.5.2 RELATIONSHIPS BETWEEN KEY ACTORS

3.5.2.1 Marketing of Imported Rice

Every country has a supply channel of imported rice. It is based on two conventional circuits: the private circuit and government circuit. Private importers supply wholesalers, semi-wholesalers, and lead retailers. The government distribution channel is permanent in some countries and sporadic in others, with aims to mitigate soaring prices on local markets. Donations of rice to governments are sold directly in national markets, as are food security stocks. These sales are often made at below prevailing market prices.

3.5.2.2 Production

Rice production is located in favorable agro-ecological zones on plains, lowlands, or irrigated lands. There are three types of rice farms:

1. **Rice grown on rain-fed land or upland.** This practice addresses food security and households' livelihoods. The average yield is 1.5 tons per hectare.
2. **Rice grown on lowlands** furnished with partial water control. These lowlands can be partitioned within bund lockers. Yields typically average 2.5 tons per hectare.
3. **Rice grown in irrigated areas.** Rice is grown on large areas (valleys or plains) where there is partial or total management of water. With an average yield of 4 tons per hectare, this system is generally targeted more at commercial production than at consumption.

Seed industries do exist in the region. The majority receive support from USAID through specific programs, as well as from the Alliance for a Green Revolution in Africa (AGRA) and the Bill & Melinda Gates Foundation. Seeds firms are private companies. They buy bed-seeds from government institutes of research, which have mandates in every country to produce bed-seeds. Among the seed companies, some are already involved in intra-regional trade, while others seek to enter the regional market.

Collaborative relationships and complementarity exists within networks such as WAGN and the *Réseau des Organisations des Producteurs Agricole (ROPPA)*, which is the regional rice farmers' network. Partnership links also exist between some commercial companies for the distribution of inputs in each country. They operate in the same supply channels. Actors work together to address constraints, needs, and challenges in the value chain. They share information on varieties and good practices.

In most West African countries, governments set floor prices for the purchase of rice. These are established after studying production costs and negotiating prices with producers and processors each year. Paddy is sold around this price, and the highest-volume buyers are those who offer the best prices. Farmers who buy subsidized inputs with government services are in principal obliged to sell their paddy at a price that was previously determined by the government and that often does not reflect market forces.

3.5.3 OPPORTUNITIES AND ISSUES

The dynamics of the rice market in West Africa is unique, as imports by government are an important part of their strategy to use this cereal to address food security needs, especially during harvests that fall short of expectations. Local rice production has received significant public policy support, especially for exports within the region. These policy decisions are often made while rice imports continue to take place. Governments target imported rice to address specific parts of the population to enhance food availability.

4. DISCUSSION OF VALUE CHAIN ASSESSMENT CRITERIA

4.1 MARKET INFORMATION

West Africa has a large market with a growing population that is expected to reach 350 million consumers of rice by 2020. Regional production covers only 40 percent of West Africa's rice needs; the region is therefore dependent on the international market for the remainder. According to the Food and Agriculture Organization (FAO), 36 percent of rice grain consumption between 2006 and 2011 was imported (FAO 2013):

- 0.4 million mt imported in 1962
- 1.9 million mt imported in 1990
- 5.2 million mt imported in 2009
- About 7 million mt imported in 2011

The demand for rice in the region is mainly for white rice or parboiled rice. The fact that the region produces only 40 percent of its needs suggests that significant opportunities exist for value chain growth and profitability.

All West Africa countries are dependent on imports of rice; they buy a significant percentage of their consumption needs. In other words, the demand for rice is very high and governments are forced to buy rice on the international market to meet consumption needs. Rice buyers are retail households, hotels and restaurants, schools (for school canteens), hospitals, armies, mines, and quarries. Wholesale buyers include wholesale traders or importers, breweries, and humanitarian organizations such as the World Food Programme (WFP).

Parboiled rice is actively traded on the sub-regional market and is increasingly appreciated by consumers. Nigeria and Guinea are the largest consumers of rice in the region.

The last report of Ecofin Agency³ estimates the supply of imported rice in Nigeria is 2.9 million mt, despite the country's declared policy of developing local production and of protecting its market by increasing taxes on imported rice. The United States Department of Agriculture (USDA) also upwardly revised estimates of Ghana's imports in January 2013, from 200,000 to 600,000 metric tons. Côte d'Ivoire imported 1.15 million mt and Senegal 1 million mt in 2012.

The rice market is poorly organized. Actors do not meet purchasers' contract requirements for quality, packaging, and delivery conditions. The transactions are handled essentially through cash payment or by tacit agreement with a negotiated payment percentage and the rest within a relatively short term (one or two weeks). The local rice market has two requirements: 1) **quality** (the rice should be free of impurities and well-packed), and 2) **quantity** (enough to deliver at agreed-upon terms). The region is

³ Ecofin Agency in Nigeria was the largest importer of rice in 2012/2013.

characterized by atomized quantities of rice produced by micro- and small farmers; their product is not suitable for wholesalers

4.2 CONTRIBUTION TO ECONOMIC GROWTH

West Africa has enormous potential for rice production. Investments in the sector will increase production and therefore increase the rice trade. The improvement of harvest and post-harvest operations will reduce losses, and hence the amount of rice reaching market will increase. There is significant donor support to countries in the region to 1) increase and upgrade rice production, 2) create added value, 3) increase the productivity of local rice, and 4) make local rice competitive compared to imported rice. Implementation of these policies encourages growth of regional rice trade, prevents outflow of currency, and thus increases national economies.

Rice's contribution to economic growth is an important part of overall agricultural gross domestic product (GDP), at about 24 percent, and to the region's total GDP (12 percent). Rice by-products are used as animal feed; rice also contributes to the development of other value chains such as poultry and to livestock fattening.

4.2.1 POTENTIAL TO INCREASE TRADE

West Africa should produce more rice to reverse the current business trend of increased imports. The region has high-yielding varieties, such as NERICA, and new methods of rice cultivation, such as the system of rice intensification (SRI) and deep urea placement (UDP), which help increase production.

An analysis of revealed comparative advantage (RCA) for the rice sector in West Africa is presented in Annex 3, based on data from 2011. The RCA index ranges from 0 to infinity, with 1 as the break-even point. That is, an RCA value of less than 1 means that the product does not have an export comparative advantage, while a value above 1 indicates that the product has a "revealed" comparative advantage.

The figures in Annex 3 show that Gambia has an RCA of 1.5, Niger's is 3.4, Mali's is 4.1, and Senegal's 9.6. Benin leads the way in rice exports, with an RCA of 82.9, giving it the largest revealed comparative advantage of the countries analyzed (see annex for more details).

4.2.2 POTENTIAL TO CREATE JOBS

The rice value chain has great potential to create permanent and seasonal jobs. However, jobs currently created in rice agro-industries are limited. Investment needs are enormous at all levels, especially in agribusiness, commercial agriculture, processing, and marketing. This investment, however, will create more and more jobs along the value chain.

4.2.3 POTENTIAL TO ATTRACT INVESTMENTS

There is potential to attract investments in the following area: 1) the enabling environment for development of the rice value chain; 2) productive facilities, such as irrigated areas and small dams for water control management; 3) upgrading on each link of the value chain, especially at the production and processing levels; 4) warehouse receipt systems (WRS), which will resolve several problems at once (respect of norms and standards, access to good/certified seeds and other inputs, access to finance and structured markets); and 5) structured markets with possibilities to establish contract farming, develop outgrower channels, and give traders or processors access to pre-financing for inputs.

There are coordinated policies, strategies, and initiatives in place:

- The *Union Economique et Monétaire Ouest Africaine* (UEMOA) and the Economic Community of West African States (ECOWAS) have regional policies and plans—the *Politique Agricole de l'UEMOA* (PAU) and ECOWAS Agricultural Policy, known as ECOWAP.
- Twelve countries in the region have strategic plans for development of rice.
- Technical and financial partners have harmonized strategies.
- Regional actors are strongly involved.

Coordination of all of these actions, however, should be improved.

4.2.4 POTENTIAL TO GENERATE VALUE ADDITION

Productive infrastructure is insufficient and mechanization is poor even though there are huge swaths of fertile land and lot of water resources in West Africa. Potential for value addition exists through adoption of good farming practices to increase yields and through use of adequate equipment for harvesting, threshing, processing, and packaging.

Lead firms have limited knowledge of the market, but are exploring new relationships with technical and financial partners. For example, AGRA have provided funds to enable NAFASO to acquire a modern processing line and seed packaging. Both Sokimex and NAFASO are eager to lead improvements in market access in terms of product sales or purchase of paddy. Part of the challenge these companies face is limited operating capital to expand their operations.

Investing in milling, processing, and packaging will contribute to local value addition in this sector. There is need to transition from traditional methods of farming toward commercial production systems, which will scale up the value chain's productivity and competitiveness. The market does exist—the constraints are financial resources and market and technical knowledge.

4.2.5 POTENTIAL TO GENERATE MARKET-BASED IMPROVEMENTS IN PRODUCTION YIELDS

The major challenge is to significantly increase and sustain regional rice production while improving its quality to satisfy a growing demand. Indeed, by 2018–2020, the demand for rice in West Africa will be between 21 and 24.5 million metric tons per year. The big questions are: 1) which systems will promote rice production to achieve this goal? 2) How can the security of the regional market be improved to reflect a recovery strategy that emphasizes sustainable regional production? 3) What forms of policy instruments and incentives should be promoted to support ongoing initiatives at both the national and regional levels? 4) How can the fluidity of the regional rice market be improved?

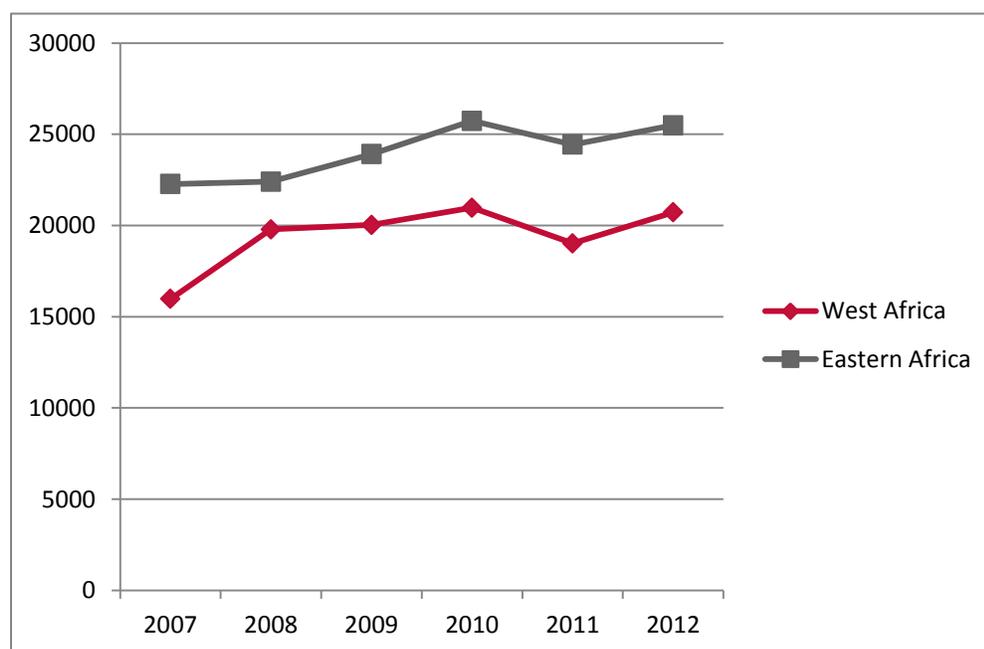
Table 5 and Figure 4 show that rice yields in West Africa are lower than those in East Africa. In 2007, West Africa had a very low yield due to drought, which created high costs for staple crops. From 2008, yields improved but were still behind those in East Africa.

Table 5: Comparative Paddy Rice Yields (kilograms per hectare)

Year	2007	2008	2009	2010	2011	2012
West Africa	15,979	19,789	20,027	20,969	19,019	20,721
East Africa	22,272	22,400	23,907	25,729	24,435	25,484

Source: FAOSTAT

Figure 4: Comparative Rice Yields in West Africa and East Africa



4.3 IMPACT ON FOOD SECURITY

Rice has a great potential to generate economic growth and increase incomes. It is an important source of potential jobs for West Africa. More than three million farm households make their living from the rice value chain. Rice brings about \$1.2 billion to rice growers in the Sahel region and \$5.3 billion in coastal areas. Rice contributes to nutritional improvements in the region's households, thus participating in food security. ECOWAP emphasizes rice as a key strategic commodity for food security (Cf. PAU). Moreover, several countries endeavor to improve food security by selecting rice as a key staple crop, with the aim of being self-sufficient in rice and even exporting surpluses. Most of the West African countries⁴ have adopted national rice development strategies, with support from the Japan International Cooperation Agency (JICA).

4.4 SOCIAL IMPACT

Women play a central role in rice production in West Africa. Whether transplanting, spreading fertilizers, or harvesting and handling post-harvest activities, they are strongly present. Many survive on rice work, either as owners or as laborers. Steaming rice is now the preserve of women who are in

⁴ Benin, Burkina Faso, Côte d'Ivoire, Guinea, Liberia, Nigeria, Togo

groups or associations. They work large quantities of paddy rice and generate substantial incomes, allowing them to better meet the needs of their families.

Vulnerable groups still remain marginalized. They sometimes have seasonal agricultural jobs for only a short period of the year. Although the potential for development of the rice value chain is enormous, young people and women do not have access to factors of production: land, inputs, credit, and storage infrastructure.

4.5 COMPETITIVENESS

West Africa has significant lowlands that are very fertile for rice production. With the creation of new varieties such as NERICA, the region has very good prospects for rice production. As shown above, the average rice yield is around 2 mt/ha. If improved seeds are used, along with good-quality fertilizers at doses recommended by extension services, the region could increase yields to 3 metric tons per hectare.

To meet market demand in a sustainable and competitive way, the focus needs to be on both quantity and quality. This will require widespread use of improved seeds, appropriate use of quality fertilizer, compliance with technical best practices, timely harvesting, effective post-harvest operations to reduce losses, and local processing. The whole package is essential to ensure proper market values for the product.

The countries with the greatest potential water resources are **Mali**, with the Markala Dam; **Burkina Faso**, with irrigated rice zones in Bagré, Bama, and Sourou; **Senegal**, with potential along the Senegal River; **Ghana**, both north and south; the Mano River countries (**Liberia**, **Sierra Leone**, **Côte d'Ivoire**, and **Guinea**); **Benin**; and **Nigeria**. In countries such as Côte d'Ivoire, Burkina Faso, Ghana, and the Mano River countries, rice development programs have been put in place to be the catalyst for regional development in general.

This will have to be done in coordination with resources from regional programs such as the SRI program from the *Conseil Ouest et Centre Africain pour la Recherche et le Développement Agricoles*/West and Central African Council for Agricultural Research and Development (CORAF/WECARD) under the West Africa Agricultural Productivity Program (WAAPP); and *Amélioration de la productivité du Riz en Afrique d'Ouest* (APRAO 2), which is funded by Spanish Cooperation and implemented by the FAO.

4.6 FACTORS THAT WOULD SUPPORT UPGRADING

Several factors will encourage market-based initiatives that would expand and upgrade the value chain's performance, capacities, and competitiveness:

1. The region's enormous potential for rice production, especially in lowlands with substantial water resources
2. The political will of several states to be self-sufficient in rice and even to export surpluses
3. The national rice development strategies developed and adopted by several countries
4. Efforts begun by the E-ATP project and continued by CORAF/WECARD to a) improve productivity by disseminating SRI, b) improve processing methods through rice parboiling, and c) engage in training of trainers and cascade training

To upgrade the value chain, the Trade Hub could focus on supporting the development of irrigated rice perimeters and lowland rice. Efforts will address food security by emphasizing long-term, sustainable

regional production. The Trade Hub will support policy instruments that accompany ongoing national and regional initiatives. Examples of these policy instruments include the Common External Tariff (CET) of UEMOA adopted in 2007 (UEMOA website), which is based on a version of the harmonized commodity description and coding within the union. The UEMOA-ECOWAS CET was validated in 2012 and adopted in 2013. This community instrument will help establish an anti-dumping and countervailing duty regulation to deal with external threats facing member countries (ECOWAS website).

4.6.1 CHAMPIONS FOR CHANGE

- **West Africa Grains Network (WAGN)** is a nascent organization that is very committed to championing changes in cereals value chains. Due to its vision, objectives, and strategic plan, WAGN could be considered a lead organization that will promote positive changes in the region.
- **Ghana Grain Council (GGC)** is developing a warehouse receipt system that is likely to impel upgrading in the rice value chain.
- **Neema Agricole du Faso (NAFASO)** is an innovative seed company working to upgrade the seed industry. It operates through a network of outgrowers and seed multipliers on a contract-farming basis.

4.6.2 ACCESS TO FINANCE

Potential financial support consists of 1) financial institutions, banks, and microfinance institutions; 2) input suppliers and agricultural equipment suppliers; and 3) service providers. There are pan-African banks such as Ecobank, Bank of Africa, Oiko Credit, the *Banque Ouest Africaine de Développement* (BOAD), the ECOWAS Bank for Investment and Development (EBID), etc.; and regional financial institutions such as Roots Capital and Enjaro,⁵ which are able to finance substantial investments in the region. There has been limited impact to date.

Access to finance poses a problem and constraint because it is very difficult for value chain actors to respond to banks' requirements for loan eligibility. For example, farmers need loans to buy inputs on a timely basis. They also could use finance to purchase more land or to buy better equipment. Processors need money for operational capital to invest (for extension of plants, improved equipment, etc.). The main conditions for accessing credit through bank loans include presenting business plans and providing the minimal guarantees demanded by the bank. The business plan must show the profitability of the project, including a cash flow analysis that identifies the expected return to the farm enterprise is sufficient to repay the credit, cover other operating costs and, presumably realize a profit.

WRS mechanisms facilitate access to finance because the commodity stock in the warehouse serves as collateral for the bank. Text Box 1 describes a WRS experience and how it benefitted farmers.

Text Box 1: Warehouse Receipts Experience: Kenya

"In February 2011, the group of farmers Witima Chicofar, Kenya, placed 173 bags of maize in Lesiolo Grain Handlers, a manager warehouse operating a certified warehouse receipts system. The cereal's market value was 398 000 KES. The farmers' group presented its warehouse receipt to Equity Bank Nakuru and used [it] as collateral for a loan of 265 000 KES; these funds were used to buy seeds, fertilizers and other inputs for planting next season. By getting enough inputs on time, they could plant in time, which allowed them to increase the performance next season. The group watched the price of corn. In June 2011, they sold their grain [for] 570 000

⁵ Enjaro is a financial institution that gives loans to expand firms. After providing a loan, Enjaro delivers technical assistance to strengthen the enterprise's technical and managerial skills. Enjaro also takes part of the firm's equity investment funds.

KES. The cost of transportation, storage and financing rose to 40 000 KES. They have made a profit of 132 000 KES as a group—that amount would not have won if [they] had sold in February” (CTA 2013).

Banks do not understand the rice sector and believe that lending to agriculture generally is too risky. In irrigated zones, risks are lower and yields are far higher than on upland and lowlands. This is because irrigation provides a guaranteed source of water for the farm enterprise and consequently lowers the perceived risk of a shortfall in harvest. Finance institutions are more comfortable funding downstream activities in the rice value chain. To be more attractive to banks, the rice value chain needs to increase productivity and competitiveness by increasing adoption of commercial farming techniques, using best practices, and presenting well-structured loan requests. The introduction of agricultural insurance could also be a solution for attracting banks to fund the rice industry.

4.6.3 PRODUCTIVE INFRASTRUCTURE

Productive infrastructure is very important for development of the rice value chain. The following physical infrastructure should be developed: 1) irrigated zones; 2) machinery, including tractors, rippers, threshers, and millers; 3) small dams for agricultural use; 4) storage facilities; and 5) roads.

4.6.4 SYNERGIES WITH EXISTING PROGRAMS

The Trade Hub may be able to create synergies with the following programs:

1. **CORAF/WECARD.** As the technical arm of ECOWAS for the implementation of the *Projet de Productivité Agricole en Afrique de l’Ouest* (PPAAO), CORAF/WECARD is focused on increased rice productivity, especially on the research inherent in SRI.
2. **Africa Rice Center.** This is a referral center for the research and development of rice in Africa.
3. **APRAO.** This program covers Côte d’Ivoire, Mali, Niger, Senegal, and Mauritania. It is funded by the Kingdom of Spain and implemented by the FAO.
4. **Rice Project of the Mano River countries.** This World Bank-funded program covers Liberia, Sierra Leone, Guinea, and Côte d’Ivoire.

Synergies may also be possible with UGER-B, Groupe Velegda, and Sokimex (Burkina Faso); CCR-B (Benin); Single Mothers Association, (Ghana); UCOVISA (Côte d’Ivoire); and CPC and ETD (Togo).

4.6.5 POLICY ENVIRONMENT

The three major legal and policy constraints to further development of the rice value chain are: 1) the diversity of tariffs across countries, 2) the large number of export formalities that are often redundant and are best described as harassment; and 3) the absence of harmonized standards across the region. ECOWAS and UEMOA are endeavoring to address these problems by promoting the application of the common external tariff.

Further progress in developing the rice value chain will require governments to make a commitment to improving the business environment. This, in turn, will require value chain actors to advocate with national governments and regional bodies, pressing for improvements in the policy environment and harmonization of regulatory regimes.

The Trade Hub will encourage rice stakeholders to advocate for:

- Development of appropriate infrastructure, such as storage silos
- Establishment of warehouse receipt systems
- Development of road networks
- Adoption of best practices at all levels of the value chain
- Creation of an appropriate enabling environment

Other important objectives include harmonization of seed policies and fertilizer prices in the region.

4.7 CLIMATE RESILIENCE AND ENVIRONMENTAL SUSTAINABILITY

With marginal agro-pastoral and agricultural land, areas of the Sahel suffer from high levels of poverty and gender inequality, marginalization, limited water supplies, and poor governance. A complex set of drivers and dynamics have led to a large and growing food security deficit. Foremost among these factors are population pressure, climate change and variability, and an increasing reliance by households on markets to meet their food needs. These dynamics and the interactions between them have made the area increasingly susceptible to volatility in food prices. The rate of population growth, volatility of food prices, and projected increases in the frequency and intensity of climatic shocks suggest that if nothing is done, the depth and width of the food deficit will continue to grow at an accelerated pace.

In this context, national governments, regional institutions, the donor community, and humanitarian and development partners widely recognize that they must support efforts to strengthen the resilience of vulnerable populations to these factors.⁶ There are at least three reasons to invest in creating resilience in targeted areas of the Sahel:

1. It is ineffective and costly (in human terms) to continually respond to the symptoms of chronic vulnerability by providing humanitarian aid every few years.
5. Humanitarian aid is costly in financial terms.
6. Chronic vulnerability hinders economic growth.

4.8 OTHER HURDLES TO SUCCESS

Access to land even in areas with irrigated systems in place is very low in general—in some irrigated areas, a household accesses only 0.5 to 1.0 hectare. In addition, women and youth face discrimination in access to land, just as they do in accessing finance through banks and other financial institutions. Mechanization is still in its infancy and efforts should be made in this direction.

In addition to those discussed above, additional major constraints undermining the rice sector include the following:

1. Value chain actors have limited access to improved technical practices for the grain sector in West Africa.

⁶ USAID defines resilience as the ability of individuals, households, communities, countries, and systems to mitigate, adapt to, and recover from shocks and constraints in a way that reduces chronic vulnerability and facilitates inclusive growth.

7. Producers, processors, and traders in the cereals sector miss many business opportunities, despite an increase in regional demand and greater availability of cereals. The actors are not well-organized, making it difficult for them to respond to market requirements.
8. A representative and credible advocacy structure (needed to promote and defend the interests of the cereals sector actors) is absent. This led to the 2008 decision to create WAGN.

4.9 SWOT ANALYSIS

Strengths

- Rice is a strategic commodity for food security at the regional level (ECOWAP and PAU).
- The region has a large amount of fertile land to cultivate for more production.
- Rice makes a substantial contribution to economic growth and income generation, and is an important potential source of employment in West Africa.

Weakness

- Agricultural inputs are high-cost and difficult to access.
- Market infrastructure (warehousing, docks, phytosanitary facilities, etc.) is inadequate.
- There is limited access to credit (for farmers, storage, traders, and millers).
- West Africa produces only 40 percent of its rice needs; it is dependent on the international market for the rest.
- Poor-quality rice is inappropriate for the transformation process and does not adhere to norms and standards.
- There is a lack of or insufficient irrigation and storage facilities.
- The economic environment is very unfavorable; there is a lack of funds for investment and operation.
- Norms and standards are lacking or are not harmonized in the region. Consequently, the quality of grains is weak (there is little concern about grades).
- Market information is limited due to the insufficiency of existing market information systems (MIS).
- Yields are weak.
- There are significant harvest and post-harvest losses.

Opportunities

- Rice is a popular staple food in most West African countries, especially in rural areas. It is one of the principle consumption foods in the region.
- There is big market for rice, both for human consumption and for animal feed.
- There are trade opportunities with the WFP and breweries that exist in all countries of the region.
- ECOWAS regulations on free trade do exist, but improved enforcement is required if trade across borders is to increase.

Threats

- There are seasonal bans on grain exports.
- Tariff and non-tariff barriers exist.

Road and cross-border harassment is a problem.

5. VISION AND UPGRADING STRATEGY

5.1 VISION

The Trade Hub envisions a rice value chain composed of well-structured markets that increasingly meet the region's demand for rice, and that encourage and facilitate investment in productivity and processing throughout the value chain. The vision includes movement from informal to formal commercial trade, with particular emphasis on intra-regional trade in rice. The goals are to reduce poverty, improve nutrition, reduce the vulnerability of West Africa's supply of rice, and increase economic benefits. Trade Hub support for this value chain would contribute to key regional-level FTF objectives.

5.2 UPGRADING STRATEGY

The Trade Hub recommends the following main strategic thrusts:

- Promote local rice by strengthening intra-regional marketing
- Stimulate investment throughout the value chain
- Develop comprehensive and dynamic partnerships on a win-win basis
- Create complementarity with similar programs and favor synergies
- Provide concrete support for market facilitation by working proactively with sellers, buyers, and transporters
- Promote access to finance

Key principles for implementing this strategy include:

- Effective and active partnership
- Building on results and lessons learned from previous initiatives
- Identifying and supporting leading players (organizations, private companies) in the context of different countries' national strategies and the ECOWAS regional strategy
- Training and other capacity building activities for key stakeholder agencies.

Proposed partners for the Trade Hub include:

- **WAGN**, which encompasses the main national cereals actors and is the preferred partner for Trade Hub for the grain value chains, including rice
- **CORAF/WECARD**'s Staple Crops Program, which aims to improve agro-processing systems in rice, sorghum/millet, and cassava to enhance marketability of these crops in West Africa
- **ROPPA** a regional producer organization that works in rice
- **APRAO**, covering Côte d'Ivoire, Mali, Niger, Senegal, and Mauritania, which is funded by the Kingdom of Spain and implemented by the FAO

- **Africa Rice Center**,⁷ a referral center for the research and development of rice in Africa
- **Coalition for African Rice Development (CARD)**, a consultative group of bilateral donors and regional and international organizations working in collaboration with rice-producing African countries to double rice production within 10 years
- **Rice Project of the Mano River countries** (Liberia, Sierra Leone, Guinea, and Côte d'Ivoire), which is funded by the World Bank
- A program funded by the Bill & Melinda Gates Foundation, to promote rice production In West Africa.
- **Global Alliance for Resilience Initiative (AGIR)**, which seeks to “Structurally reduce, in a sustainable manner, food and nutritional vulnerability by supporting the implementation of Sahelian and West African policies” (AGIR 2012)
- **UEMOA-ECOWAS Regional Offensive for Sustained Recovery of Rice Production in West Africa**, an initiative to accelerate the implementation of ECOWAP/CAADP

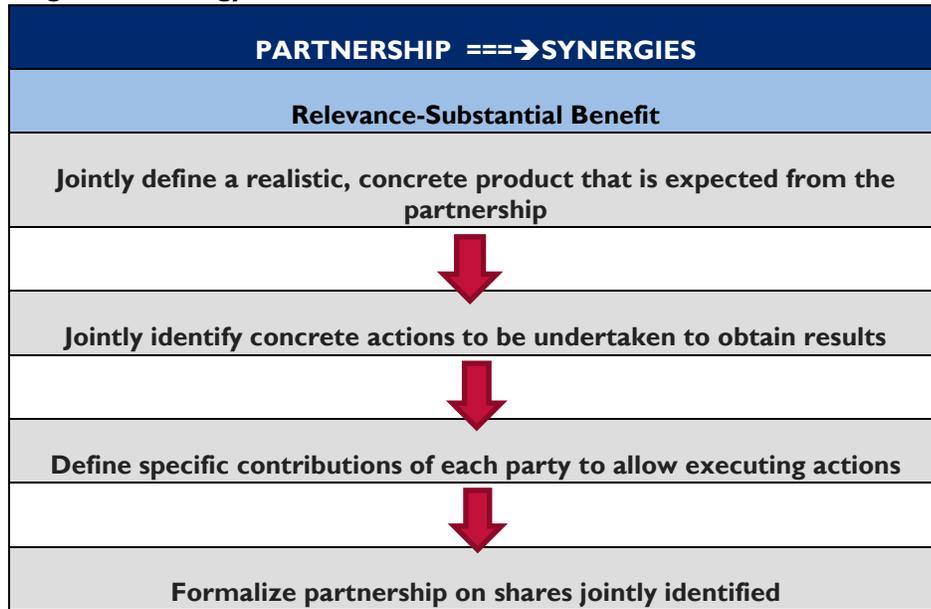
At the national level, the main actors are the inter-professional and national associations of rice, including the following:

- *Comité Interprofessionnel de Riz du Burkina* (CIR-B) in Burkina Faso
- CCR-B in Benin
- *Association Nationale des Riziculteurs de la Cote d'Ivoire* (ANARICI) in Côte d'Ivoire
- GRIB in Ghana
- Platform Rice in Mali
- CPC in Togo
- *Fédération des Coopératives des Producteurs de Riz* (FUCOPRI) and *Riz du Niger* (RINI) in Niger
- Rice Farmers Association of Nigeria (RIFAN)
- Rice Farmers Association in Senegal

⁷The Africa Rice Center (AfricaRice) is a leading pan-African rice research organization committed to improving livelihoods in Africa through strong science and effective partnerships. AfricaRice is one of the 15 international agricultural research centers that are members of the Consultative Group on International Agricultural Research (CGIAR) Consortium. It is also an intergovernmental association of African member countries.

Figure 5 outlines the structure of the proposed partnerships for Trade Hub.

Figure 5: Strategy Chart



5.3 RISKS AND MITIGATION

The major risks that could impede achievement of the Trade Hub’s objectives include:

- Seasonal grain export bans/restrictions by certain countries
- Continued application of tariff and non-tariff barriers
- Social and political unrest in a country, creating insecurity or closing borders
- Non-collaborative partnerships

To address these risks, the Trade Hub will do the following:

- Support and assist WAGN and key stakeholders to advocate with UEMOA, ECOWAS, and their member countries
- Collaborate with ECOWAS to support increased harmonization of tariff regulations, in order to cancel or alleviate them
- Use possible alternative ways to continue working with a country (if there is political or social unrest) or suspend activities until the situation returns to normal

6. ADDITIONAL INFORMATION NEEDED

Real-time market information for the rice value chain within West Africa does not exist. Rice trade movements are not documented. E-ATP strived to generate data by collecting figures on some corridors (now continued by CILSS), but a larger, more-concerted effort should be made.

ANNEX I: BIBLIOGRAPHY

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ANNEX 2: PERSONS AND ORGANIZATIONS INTERVIEWED

1. **Sanou Soumaila**, Chairman of WAGN and President of CIC-B Burkina Faso, a farmer
2. **Tom Gambrah**, Vice President WAGN, Chairman of GGC, and owner of a cereals processing firm
3. **Lionel Guezodje**, General Secretary of WAGN and Chairman of the *Fédération des Unions de Producteurs Agricoles* (FUPRO) Benin
4. **Aissatou Deme**, Treasurer of WAGN and owner of a processing firm
5. **Paa Kwesi Florentin**, Former Executive Secretary of GRIB

ANNEX 3: REVEALED COMPARATIVE ADVANTAGE

This annex shows the revealed comparative advantage for rice, along with its supporting data.

Figure 6: Export Data from 2011 (Except Guinea-Bissau [2004], Benin and Burkina Faso [2010])

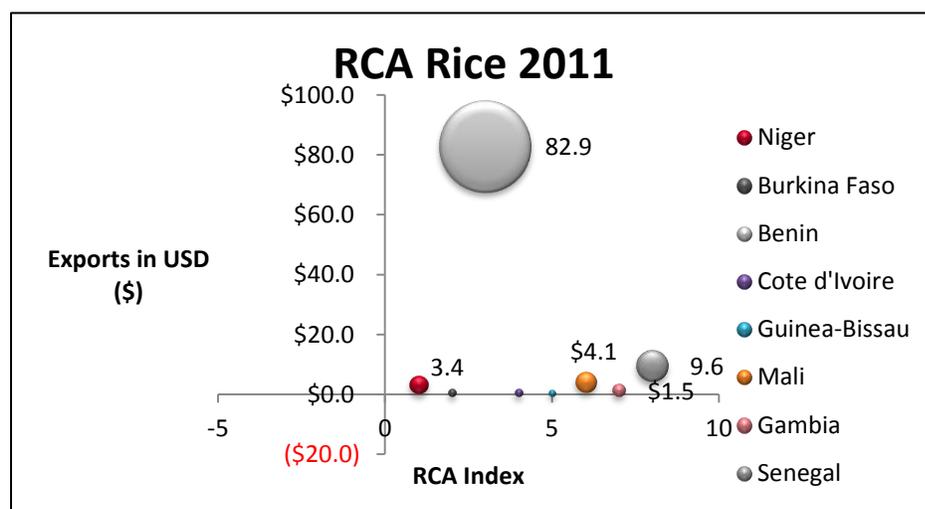


Table 6: Export Data from UN Comtrade, Country Totals from WTO.org, and World Commodity Export from FAOSTAT 2011

A	C	D	E	H	L	M	N	O	P
Products	Niger	Burkina Faso	Benin	Cote d'Ivoire	Bissau	Mali	Gambia	Senegal	World
Rice	\$4,744,208	\$601,175	\$90,580,470	15,303,223	\$141,454	\$6,009,163	\$264,671	\$52,527,822	\$23,187,004,000
Country Total Exports	1,098,000,000	768,000,000	\$848,000,000	19,500,000,000	230,000,000	1,139,000,000	\$133,000,000	\$4,251,000,000	
World Total Exports									
RCA Rice	\$3.4	\$0.6	\$82.9	\$0.6	\$0.5	\$4.1	\$1.5	\$9.6	

EXPLANATION OF REVEALED COMPARATIVE ADVANTAGE

The idea of determining a country’s “strong” sectors by analyzing the actual export flows was pioneered by Liesner (1958). The procedure was refined and popularized by Bela Balassa (1965, 1989), and is popularly known as the Balassa Index. Alternatively, as the actual export flows reveal the country’s strong sectors, it is also known as revealed comparative advantage, or RCA.

Balassa defined the export performance of a specific product/industry from a country—as measured by its RCA index—as the relative share of the country’s export of the product in the world export of the same product, divided by the overall share of the country in world exports. More specifically, the

revealed comparative advantage index of product j exported from country i (RCA_{ji}) can be expressed as follows:

$$RCA_{ji} = (X_{ji}/X_{jw}) / (X_i/X_w), \text{ where:}$$

X_{ji} = exports of product j from country i X_{jw} = world exports of the product j X_i = exports of country i X_w = world exports

The RCA index ranges from 0 to infinity with 1 as the break-even point. That is, a RCA value of less than 1 means that the product does not have export comparative advantage, while a value above 1 indicates that the product has a “revealed” comparative advantage.

RCA FOR THE CASE OF RICE

Export data (X_{ji}) for each country are shown in the row 2 under respective country names; so the formula can be written as X (rice, Nigeria); X (rice, Burkina Faso), etc.

X_{jw} or X (rice, World) is in cell P2 = \$23 Billion (rounded)

X_i , exports of the countries, are shown in row 3

X_w , world total exports in cell P4 = \$18 Trillion

As seen in the chart above, Gambia shows the first revealed comparative advantage of the sample in rice exports, where $(N2/P2)/(N3/P4) = 1.5$. Next is Niger, with an RCA index of 3.4, Mali with an RCA of 4.1, and Senegal with an RCA of 9.6. Benin leads the way in rice exports from this sample, with an RCA index of 82.9. Thus, Benin has the revealed comparative advantage in this reference group for rice.

These calculations are limited to some degree by the availability of export data.

ANNEX 4: REPARTITION GLOBALE DES FLUX PAR PRODUIT, NOVEMBRE 2013

Produit	Quantité Nov 2013	Valeur (CFA) Nov 2013	Valeur (CFA) Oct 2013	Valeur (\$) Nov 2013
Maïs	8,471	1,123,414,079	994,435,202	2,246,828
Mil	5,627	1,133,821,262	1,245,367,144	2,267,643
Riz étuvé	587	160,237,828	434,682,399	320,476
Sorgho	5,994	1,166,826,204	723,770,165	2,333,652
Bovins	42,061	13,533,894,243	13,634,224,201	27,067,788
Chèvres	8,727	211,071,194	28,562,819	422,142
Moutons	54,056	3,363,295,741	3,041,354,157	6,726,591
Total		20,692,560,551	20,102,396,087	41,385,121

ANNEX 5: RICE PRODUCTION IN WEST AFRICA

Country	2005	2006	2007	2008	2009	2010	2011	2012
Benin	78,329	70,972	74,866	105,596	112,700	124,975	21,9626	219,101
Burkina Faso	93,516	113,700	68,916	195,102	213,584	270,658	240,866	319,390
Cabo Verde								
Côte d'Ivoire	703,931	715,898	606,310	679,969	687,721	722,609	702,434	725,000 F
Gambia	17,934	31,024	11,395	38,300	79,000	99,890	51,136	54,219
Ghana	287,000	250,000	185,340	301,920	391,440	491,603	463,975	481,134
Guinea	1,272,415	1,340,313	1,401,592	1,534,088	1,455,932	1,498,962	1,670,000 *	1,919,000 *
Guinea-Bissau	98,340	106,000	127,250	148,757	181,894	209,240	175,213	198,504
Liberia	154,800 *	164,000 *	231,800 *	295,150 *	293,000 *	296,090 *	298,000 F	291,000 *
Mali	945,823	1,053,236	1,082,384	1,624,246	1,950,805	2,305,612	1,741,472	1,914,867
Mauritania	72,000	70,462	82,165	82,163	53,569	134,447	161,076	243,000 *
Niger	59,902	78,377	70,000	32,475	20,117	29,963	13,324	50,254
Nigeria	3,567,000	4,042,000	3,186,000	4,179,000	3,546,250	4,472,520	4,567,320	4,833,000 *
Saint Helena, Ascension and Tristan da Cunha								
Senegal	279,080	190,493	193,379	408,219	502,104	604,043	405,824	630,654
Sierra Leone	738,000	1,062,320	588,004	680,097	888,417	1,026,671	1,078,005	1,150,000 F
Togo	72,858	76,284	74,843	85,540	121,295	110,109	112,233	160,939

* = Unofficial figure | [] = Official data | F = FAO estimate
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