

DFID Market Development (MADE) in Northern Ghana Programme



NATHAN
ASSOCIATES INC.

Submitted to
Department for International Development, Ghana

Submitted by
DAI in association with Nathan Associates London Ltd.
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DFID PURCHASE ORDER NUMBER
5929

11 August 2015

Contents

SECTION 1. Introduction.....	1
SECTION 2. Mapping the Poor and other Actors	4
2.1 The Poor.....	4
2.2 Other Actors	5
SECTION 3. Market Growth and Segmentation Analysis.....	5
SECTION 4. Value Chain Analysis	8
SECTION 5. Analysis of support functions	12
SECTION 6. Analysis of Policies and Institutions	12
SECTION 7. Identification of Systemic Constraints	17
SECTION 8. Conclusion.....	18

SECTION 1. INTRODUCTION

Rice is an important food in Ghana ranked as the second most important food staple. It competes strongly with traditional coarse grains and roots and tubers in the consumption basket¹. In addition to being a staple food for the urban population, rice is also an important food in the communities in which it is produced.

The domestic market for rice has been expanding rapidly, and although estimates vary,² what is clear is that roughly two thirds to 70% of rice consumed in Ghana is imported. A breakdown of price differences between imported and local rice shows that many Ghanaians are willing to pay more for the better quality they associate with imported rice. Ghana is however able to compete on price with imported rice as the cost of production is lower than countries from which imports are sourced (e.g., Thailand). The area under cultivation and the production of rice in Ghana has been rising faster than most crops and is expected to continue to rise in future. There is a large and growing opportunity to increase rice production in Ghana and, by matching the quality of imported rice, to earn higher prices for what is produced.

Rice is the fourth most important crop in Northern Ghana, cultivated by over 279,000 households³ and therefore plays a very important role in providing incomes and employment. Northern Ghana has a comparative advantage in rice production and contains about 70per cent of the total area under rice production in Ghana, with Northern and Upper East regions prominent⁴. Even though current productivity is lower than what is achievable, it is the most profitable of the cereals grown in the North with average net profit of US\$583/ hectare of non-irrigated, lowland rice field, and US\$240/hectare of upland rice field⁵. Farmer's incomes could be doubled through increasing the use of modern inputs and growing rice under irrigation. Rice production in the North uses large quantities of labour for planting, weeding and harvesting. In addition, the processing of rice (par boiling, milling) also provides employment and incomes to large numbers of women in the North.

A recent large investment in rice processing in Northern Ghana provides a major new opportunity to transform the rice marketing system to make it more responsive to the market, more efficient in creating value and to work better for the poor. Avnash's new mill is expected to become operational in 2014. Unlike other new mills in Ghana, Avnash's approach will be to rely on local procurement rather than captive farms, providing the opportunity for small rice farmers to benefit. This provides an important opportunity to include the poor smallholders in its supply chain and use Avnash's purchasing power to improve varieties and inputs and collection systems to increase the incomes of farmers, and to provide opportunities for the poor to supply on-farm labour. Improving the competitiveness of existing processors and traders, especially women, would help to ensure that they are able to continue to benefit from the growth of rice consumption.

The rice market thus represents a major opportunity to make markets work for the poor in the North. A summary diagnostic of the functioning of the market is set out in the table below.

¹MoFA (2012), Agriculture in Ghana, Facts and Figures 2012

² Much of the data available from both official and non-official data sources is inconsistent.

³ GLSS 5 Survey, 2008

⁴MoFA (2012), Agriculture in Ghana, Facts and Figures 2012

⁵Diakite, S, Jaeger, P, White, P, Cook, D, Bill and Melinda Gates Foundation, Overview of the rice value chain in Burkina Faso, Ghana, Nigeria and Tanzania, May 16 2012

Table 1. Rice Market System Analysis

Mapping the poor and other actors	Market Growth and Segmentation Analysis	Value Chain Analysis	Analysis of support functions	Analysis of policies and institutions	Identification of Systemic Constraints
<p>The Poor</p> <ul style="list-style-type: none"> About 80 per cent of the 279,000 rice farmers in the North are poor. Poor farmers grow rice under rainfed conditions (non-irrigated lowland & upland rice). The better off farmers cultivate rice during dry season on irrigated fields. Most farmers apply traditional farming methods without modern inputs or equipment for production & harvesting resulting in low yields & poor quality. Rice is a labour intensive crop that uses family labour, labour sharing (in kind) and some cash labour provided by the poor. Trading and parboiling is mainly done by women, milling by men, providing income to more than 100K people in micro enterprises. 	<p>International Market</p> <ul style="list-style-type: none"> 70% of rice consumed in Ghana is imported, as domestic production has not been able to keep up with growing demand <p>Domestic Market</p> <ul style="list-style-type: none"> Very fast market growth (11.8 per cent pa) driven by lifestyle changes and incomes, rapid growth is set to continue. Three main preferences prioritised in descending order: straight milled over parboiled, imported over local and aromatic over non-aromatic. The perfumed rice segment is more than 80 per cent of all imports and still growing share. The poor quality domestic market segment is not growing, as consumers prefer better milled (imported) rice. More perfumed rice now grown domestically, but local parboiling and 	<p>General</p> <ul style="list-style-type: none"> Increased production in last decade mainly from increase in area. Total production of rice in Ghana was estimated about 481,000 MT (paddy) and 289,000 MT (milled rice) on 189,000 ha in 2012, with production growing by 71% and area planted growing by 28% since 2001 The low input, low output domestic production system delivers sub-optimal, value, albeit cost competitively. Currently farmers mainly use recycled seeds. The commercial seed market is severely underdeveloped. Most new seed has come from government and donor projects. Local parboiling and milling are of poor quality, using poor, low cost technology, but is 	<p>Research</p> <ul style="list-style-type: none"> Weak support functions result in low adoption rates of new, technologies, new varieties and better agronomic practices. SARI, CRI and WARDA have recently released varieties with accompanying GAP. Up take is poor due to poor dissemination and commercialisation <p>Knowledge, Extension</p> <ul style="list-style-type: none"> Poor dissemination of better agronomic practices One extension agent per 3,000 farmers and the agent is constrained by resources so extension is very poor <p>Market Information</p> <ul style="list-style-type: none"> Information on prices is readily available but knowledge of market trends, purchase criteria and channels for different market segments is not available slowing down 	<p>Policies</p> <ul style="list-style-type: none"> General agricultural policy is supportive of the use of modern inputs for rice with fertiliser and seed subsidised. Protection of the rice subsector has had an impact on domestic production but not on the trade balance as demand has grown strongly. The main driver of rice policy is the National Rice Development Strategy 2010 which aims to double production by 2018 largely by increasing yields. However, many of its policies have yet to be implemented. The NRDS aimed to mobilise donor funds and the support of the private sector which has materialised in some areas but not as strongly as envisaged. <p>Public Institutions</p> <ul style="list-style-type: none"> Sector institutions 	<p>Key Market Failures</p> <ul style="list-style-type: none"> Under supply of public goods - research, breeder and foundation seeds, extension, irrigation Market information failures and Northern farmer's remoteness from markets in the South reduces knowledge of what the market wants. Market power lies with wholesalers in the large cities and they have failed to pass on higher consumer prices to farmers. Market failures in financial markets limit ability of farmers, traders and processors in the North to invest in rice farming and processing. Coordination failures result in bottlenecks across the value chain that make the system slow to respond to market trends. Contract growing is weakened by lack of effective enforcement of



Mapping the poor and other actors	Market Growth and Segmentation Analysis	Value Chain Analysis	Analysis of support functions	Analysis of policies and institutions	Identification of Systemic Constraints
<p>Other Actors</p> <ul style="list-style-type: none"> Market dominated by two importers, Finatrade and OLAM, which together capture an estimated 60per cent of the Ghanaian market. No major mills in Ghana prior to 2010. Recent investments in 5 major mills including Avnash. Most new mills have in-company farms, Avnash has to build supply chain. 	<p>milling are still poor.</p> <ul style="list-style-type: none"> Without pro-poor supply chains, any increase in domestic market share may exclude poor as producers. Without better technology incomes from parboiling milling and trading (dominated by women) may fall. 	<p>cost competitive.</p> <ul style="list-style-type: none"> There is a huge increase in the price of milled rice between Tamale and Accra which cannot be accounted for by cost of transport and handling. Wholesalers appear to earn high margins. Local rice is sold loose, unbranded reinforcing the negative image of its quality. 	<p>market responsiveness to trends.</p> <ul style="list-style-type: none"> There are no strong information exchange platforms. <p>Finance</p> <ul style="list-style-type: none"> Under-capitalised rural banks and MFIs lend small amounts to rice farmers/processors, commercial banks only lend against collateral Under intensive, modern cultivation, growing rice is capital intensive. Access to finance is a key constraint for farmers to switch to more intensive farming. Processors and traders need finance to purchase better technology. <p>Irrigation</p> <ul style="list-style-type: none"> Under investment in irrigation schemes and poor maintenance of existing ones. 	<p>are underfunded, and ineffective in targeting support and changing behaviour.</p> <p>Donor programmes</p> <ul style="list-style-type: none"> MoFA is implementing several major donor funded programmes in the North that cover rice of which the Northern Rural Growth Programme (NRGP) and Ghana Commercial Agriculture Project (GCAP) are the largest. NRGP aims to strengthen commodity chains, invest in infrastructure and improve access to finance. GCAP aims to work with commercial famers to develop out-grower schemes but is yet to start. USAID's ADVANCE has used a value chain approach working with nucleus farmers. Its Agriculture Technology Transfer Project aims to improve on farm and processing technology. 	<p>contract leading to widespread side selling.</p>



SECTION 2. MAPPING THE POOR AND OTHER ACTORS

2.1 THE POOR

Rice is the second most important cereal crop in the Savannah zones of Ghana: production is focused in the Northern (37%), Upper East (27%) and Volta (15%) regions of the country⁶. Table 2 shows that there has been a large increase in both production and cultivated area in the Northern Region. Most production is done by smallholder farmers with farms smaller than one hectare⁷, using traditional methods with low levels of inputs. The GLSS 5 estimates that 306,153 households grow rice, 279,073 of which were in the savannah zone⁸. Nationwide, 70% of rice is sold on the market, but only 59% of rice in the Northern Savannah zone is commercialised and has a larger proportion of home consumption compared to other areas⁹.

Table 2. Production in Northern Province

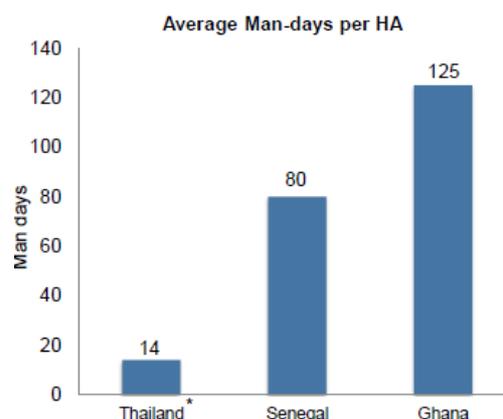
	Production (metric tons)	Area Harvested (Ha)
2000	72,960	30,400
2011	171,293	73,389

Source: CountryStat Database

Average rice yields in Ghana are around 2.5 MT/ha on non-irrigated lowland rice. But they are much lower for upland rice grown by poor farmers (1.5 MT/ha). Fortunately, upland rice accounts for only 6% of rice production. The National Rice Development Strategy classifies about half of smallholders as potential commercial rice growers. The report cites lack of market access, poor infrastructure, land tenure issues, weather related risks, risk aversion and low technology uptake as the major roadblocks to successful commercialised activity¹⁰. Nevertheless, the low input output systems used are competitive in cost, especially non-irrigated lowland rice where the availability of moisture in the soil is high.

Most smallholder rice farmers use recycled seeds for cultivation, and use little or no agrochemicals including fertilisers. Poor commercialisation of new varieties, unfamiliarity with their agronomy, lack of capital to buy the package of seeds and the other inputs they need and lack of assured markets for the paddy produced prevents the adoption of new varieties that are in greater demand in the market and deliver better yields and incomes for the farmer. Farmers also continue to dry and thresh paddy using poor technology, which leads to the grains becoming brittle, requiring expensive par boiling to avoid very high rates of broken rice. This depresses the price received by farmers.

In Ghana, rice production is labour intensive, especially if produced according to the best agronomic practices (nursing, transplanting, fertiliser and chemical application etc.) and without mechanisation. Labour use in Ghana is much higher than in other countries (figure facing). Labour, hired for pay and in-kind, is provided by the poor, the



⁶ Ragasa, C., Dankyi, A., Acheampong, P., Wiredu, A. N., Chapoto, A., Asamoah, M., & Tripp, R. (2013). Patterns of adoption of improved rice technologies in Ghana.

⁷ Angelucci F., Asante-Poku A. and Anaadumba P., 2013. Analysis of incentives and disincentives for rice in Ghana. Technical notes series, MAFAP, FAO, Rome.

⁸ GLSS 5 Survey

⁹ Note: This statistic may be skewed as the north is also the largest producer: Ragasa, C., Dankyi, A., Acheampong, P., Wiredu, A. N., Chapoto, A., Asamoah, M., & Tripp, R. (2013). Patterns of adoption of improved rice technologies in Ghana.

¹⁰ National Rice Development Strategy, 2009

majority being women. The smallholder producers use mainly family labour and labour sharing. Farmers with more capital are able to cultivate rice using paid labour in the rainy season and dry seasons on irrigated fields. Selling labour to rice farmers helps to boost the incomes of the poor.

A very large number (100,000) people are involved in the processing and trading of rice. The incomes earned by most are modest as the scale of operations is low and margins are modest. Nevertheless, the activity helps women to supplement household incomes.

2.2 OTHER ACTORS

The main actors in the value chain are input suppliers, farmers, bulkers, processors and millers, wholesalers and retailers (see Section 4 for a more detailed description of their roles). Among these different actors, the majority of farmers are male, while processing is mostly done by women. Parboiling and trading (bulkers, processors, wholesalers and retailers) are done mainly by women, and milling by men. These activities offer income opportunities for thousands of people in micro enterprises, mostly women.

The imported rice market, however, is dominated by few importers, with Finatrade and Olam accounting for about 60 per cent of the total rice import¹¹. Others, including Stallion, Imexco, City Investment Group, Royal Bow Co. Ltd, CCTC, Cereal Investment Co. Ghana Ltd and Ezal Trading Ghana Ltd, account for the remaining 40 per cent of rice imports. Some of these importers also wholesale local rice, and are gradually developing supply chains that make it possible to aggregate, process and bag the right varieties of local rice for distribution. Prior to 2010, there were no major mills in the country.

Although there has been a recent investment in 5 major mills in the country, and more are planned to open soon, most mills have in-house farms and do not rely on smallholders to provide paddy to the mills. This trend may exclude smallholder rice producers and processors from the chain, as it does not offer enough opportunity for them to improve their production, productivity and quality. In the case where an investment in a mill includes an out grower scheme or to purchase through agents who are large farmers, such as Avnash in the North, there is great opportunity to include the poor in the development of the market.

The National Rice Development Strategy highlights the importance of NGOs in the country, naming GRIB, Amasachina, CRS and Technoserve specifically. The strategy assigns roles to NGOs in “extension, group formation and development, micro-financing, marketing and M&E”¹². However, in general, the NGOs have not made a major mark on the production or processing of rice in the North. They have not been able to harness the commercial incentive to make a difference to why and how rice farmers grow paddy or how it is processed.

SECTION 3. MARKET GROWTH AND SEGMENTATION ANALYSIS

3.1 INTERNATIONAL MARKET

The global rice market was worth \$23 billion in 2011, at an average price of US\$639/tonne. Because of the spike in food prices, production has increased by 50% in the last decade. The market has shifted with the emergence of the BRIC countries. India is now the largest exporter, overtaking Thailand and Vietnam, while China is the largest importer. It is predicted that the entry of these large economic powers will help stabilise the global market due to the massive increase in both export and import volume. Imports are highly fragmented: the top six importers only make up between 20-30% of the market.

¹¹ Diakite, S, Jaeger, P, White, P, Cook, D, Bill and Melinda Gates Foundation, Overview of the rice value chain in Burkina Faso, Ghana, Nigeria and Tanzania, May 16 2012

¹² National Rice Development Strategy, 2009

The import of broken rice (the main variety imported by Ghana) has grown from US\$97 million in 2004 to USD\$220 million in 2012. Ghana is heavily reliant on foreign markets: 70% of rice consumed in Ghana is imported, most of which goes to the urban market. 36% of rice is from Thailand, 30% from Vietnam and 22% from the United States¹³. In order for any import substitution policy to succeed, Ghana must improve the quality and diversity of locally produced rice to compete with imported rice. Even with the strong growth in production, Ghana is likely to remain a net importer of rice in the near future.

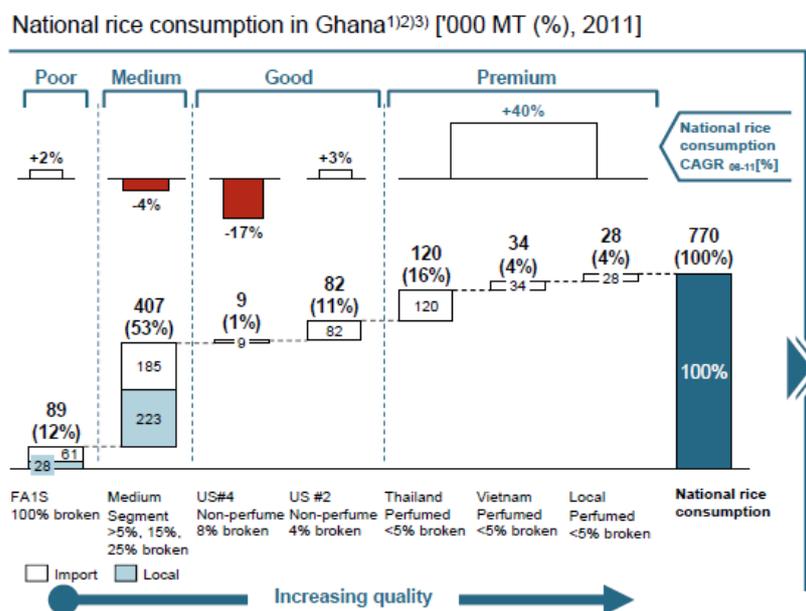
Exports are virtually non-existent, and policy has focused on meeting the demand in the local markets.

3.2 DOMESTIC MARKET

Rice consumption has been growing at a very rapid average of 11.8% p.a. Urbanisation, population growth, higher growth and changing consumer preferences are the main drivers of growth of the rice market. Urbanisation has prompted growth due to higher average income levels, the convenience of rice preparation and the use of rice by fast food restaurants and informal street vendors. Urban areas account for 76% of demand for rice¹⁴, Furthermore, much of this demand is met by imports which are preferred by urban, higher income consumers. Domestically produced rice is sold mainly in rural markets: only 20% of local rice is consumed in urban markets¹⁵.

Per capita consumption of rice in Ghana has increased from about 17.5 kg in 1999 to 38 kg in 2008 and it is projected to reach 63 kg by 2018¹⁶. The Ministry of Food and Agriculture also estimated that demand for rice in Ghana will continue to increase at the compound annual growth rate of 11.8 per cent per cent from 939,920 metric tons to 1,644,221 metric tons between 2010 and 2015¹⁷.

Figure 1. Ghana's Rice Market¹⁸



¹³ FAOStat

¹⁴ Angelucci F., Asante-Poku A. and Anaadumba P., 2013. Analysis of incentives and disincentives for rice in Ghana. Technical notes series, MAFAP, FAO, Rome.

¹⁵ Bill and Melinda Gates Foundation Report, Overview of the Rice Value Chain in Burkina Faso, Ghana, Nigeria and Tanzania, September 18th 2012

¹⁶ National Rice Development Strategy 2009

¹⁷ Ragasa, C., Dankyi, A., Acheampong, P., Wiredu, A. N., Chapoto, A., Asamoah, M., & Tripp, R. (2013). Patterns of adoption of improved rice technologies in Ghana.

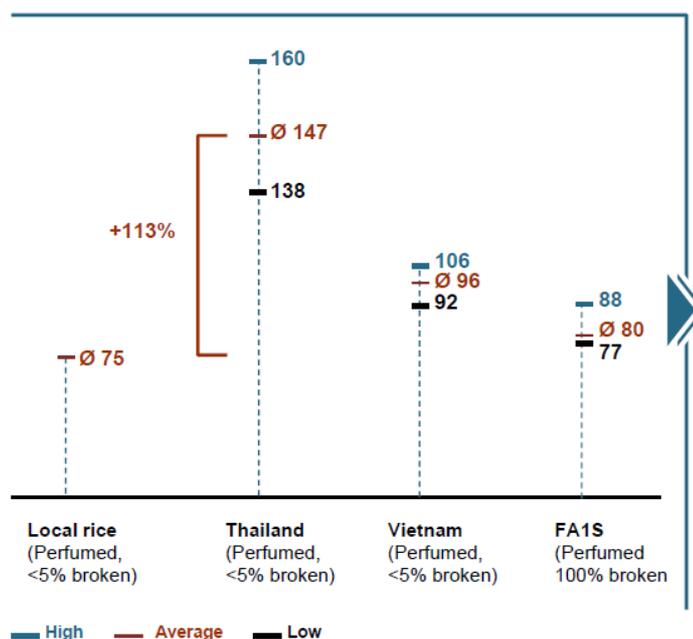
¹⁸ Bill and Melinda Gates Foundation Report, Overview of the Rice Value Chain in Burkina Faso, Ghana, Nigeria and Tanzania, September 18th 2012

The rice market in Ghana, as in all countries, is highly segmented by variety, type of processing, grain quality and source of production. Market growth is increasingly driven by premium rice segment (mainly imported) which is growing at 40 per cent per annum, while the medium segment (largely local rice) is shrinking at 4 per cent per annum. The urban market, which is the main consumer of rice in Ghana, prefers premium rice and is willing to pay for the quality. Figure 2 shows that perceived quality is a major factor in consumer purchasing decisions: consumers are willing to pay a price premium of 113 per cent for imported Thai rice over premium local rice.

Urban rice consumers prefer imported over local rice for three main reasons: they prefer straight milled rice over local parboiled; it is aromatic (perfumed); and it is better cleaned, de-stoned and polished to become white. Though these characteristics are sensitive to price, the price elasticity of demand is primarily dependent on the income of the buyer¹⁹. Perfumed long-grain, white rice is the preferred choice in urban markets, most of which is currently imported.

Only 20 per cent of the locally produced rice meets the consumer preference of the urban market. Thus, despite the 37% tax and levies (import tax of 20%) applied to imported rice²⁰, it still manages to crowd out domestic rice. Perfumed rice in particular is estimated to account for 81 per cent of overall rice imports. While there has been some discrepancy in import data, it is clear that domestic rice production and supply has not kept pace with the increasing demand for high quality rice and the changing consumer preferences towards fragrant, long-grain, white rice. Only rural consumers in the North remain loyal to local, parboiled, non-aromatic rice.

Figure 2. Market price of high quality milled rice in Ghana, 2012 (GH¢/50 kg bag)



Source: Bill and Melinda Gates Foundation Report, Overview of the Rice Value Chain in Burkina Faso, Ghana, Nigeria and Tanzania, September 18th 2012

Although more perfumed rice is being grown locally, it fails to respond to the needs of the fastest growing market segment due to poor harvesting methods that make it brittle, hence requiring parboiling, and inadequate processing technology with the small rice mills frequently lacking de-stoners, cleaners and polishers. Parboiling remains essential in Northern Ghana but the equipment

¹⁹Gage, D., Bangnikon, J., Abeka-Afari, H., Hanif, C., Addaquay, J., Antwi, V., & Hale, A. (2012). The Market for Maize, Rice, Soy and Warehousing in Northern Ghana. *USAID/EAT/Fintract Inc. Project Report*, 27-34.

²⁰Asuming-Brempong, Samuel, and Yaw Bonsu Osei-Asare. "Has Imported Rice Crowded-Out Domestic Rice Production in Ghana? What Has Been The Role Of Policy." *AAAE Conference Proceedings, Accra, Ghana*. 2007.

used is crude and results in uneven cooking of the paddy. It is also becoming expensive as the price of firewood has become costly.

The large new mills that were established recently hope to be able to supply perfumed, straight milled rice that matches the quality of imported rice from domestically grown paddy. They wish to take advantage of the gradual shift towards growing perfumed rice varieties in Ghana. Fed with the right paddy, they hope that state of the art mills, such as Avnash's, will be able to supply rice that meets the purchase criteria of affluent consumers at a competitive price to imports.

However, to take advantage of the situation, two major changes are needed:

1. That farmers in the North, aware that Avnash's presence is a game change, step up paddy production dramatically. The new mill that Avnash is set to complete in mid-2014, has a capacity to produce 150,000 MT of which 75,000 MT will come on stream in 2014 and the same amount in 2015. In 2015, the mill will need more paddy than the North produces at present.
2. The Northern farmer can be persuaded to give up on existing varieties and take up new varieties with new agronomic and post-harvest practices.

There is no reason why, with the right variety of seed, good harvesting and drying and better mills, Ghana cannot produce the rice that its consumers want price competitively. However, what is up for grabs is who benefits from this, whether the new mills, with their captive farms to grow paddy, will simply capture all the gains. Or will the new mills find it more efficient to establish supply chains that are more inclusive of smallholder farmers and so ensure that the increases in market share of domestic rice benefit small producers. This is where MADE can make a difference.

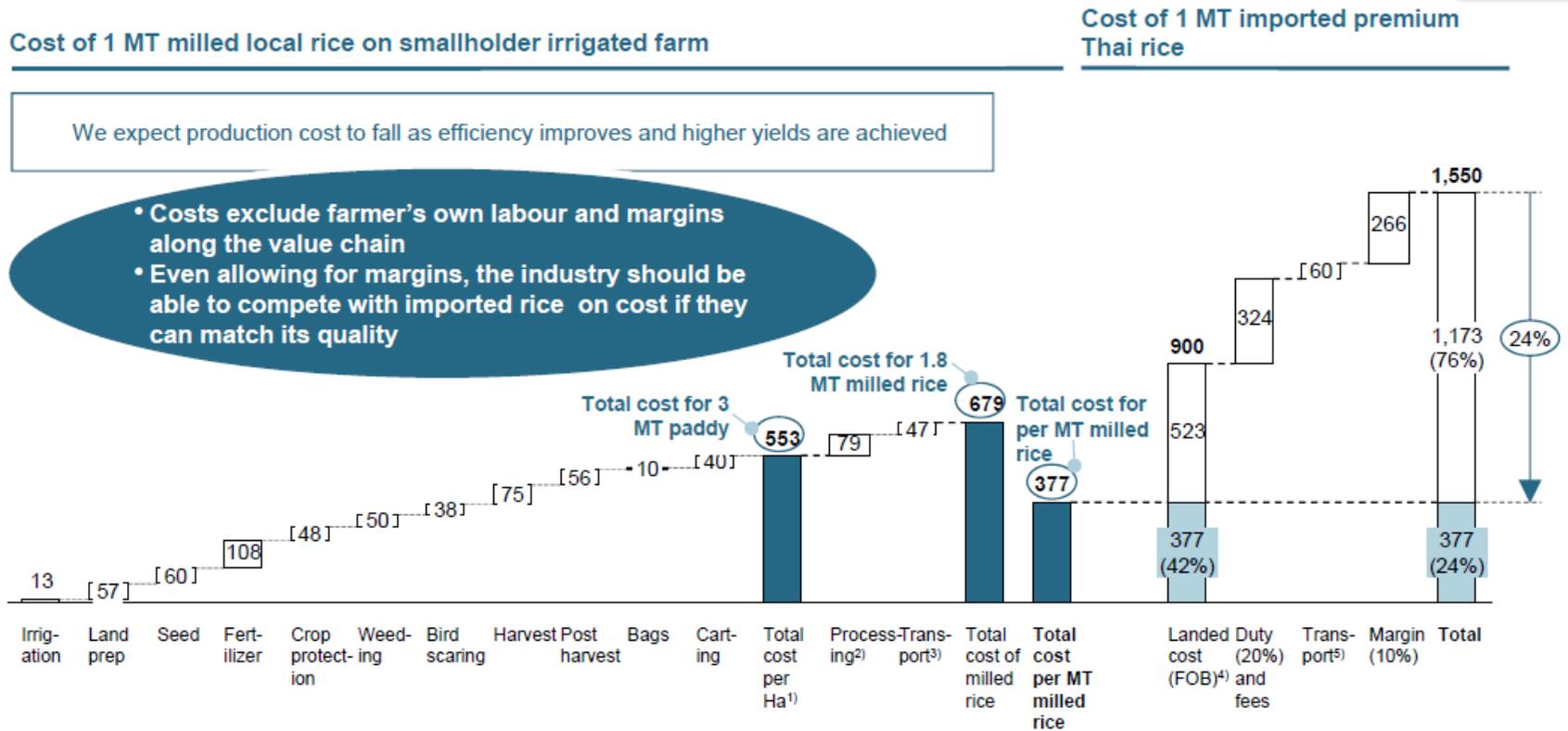
SECTION 4. VALUE CHAIN ANALYSIS

Rice is produced under 3 systems in Northern Ghana: Upland rice production which contributes 6 per cent of the total, lowland rice 78 per cent and irrigated 16 per cent. Rain-fed upland farming yields range from 1.0-1.5 MT/ha, rain-fed lowland yields are 2.0-2.5 MT/ha and irrigated range from 3.0-4.0 MT/ha. These yields are comparable to neighbouring countries such as Nigeria. The average yield of 2.5 MT/ha is in fact significantly higher than neighbouring countries (e.g. Nigeria at 1.8 MT/ha) because the majority of rice is cultivated on lowland fields. The National Rice Development Strategy (NRDS), sets targets for yields to increase to 2.5 MT/ha for upland, 3.5 MT/ha for lowland and 6.0 MT/ha for irrigated with the average yield increasing to 4.0 MT/ha²¹. In spite of lower than potential yields, a report by the Bill and Melinda Gates Foundation (BMGF) shows that farmers on irrigated farms can produce rice at 24 per cent of the cost of imported premium Thai rice (USD 377/MT). Rain-fed lowland farmers can produce at 21 per cent of the imported Thailand premium rice at USD 331/MT (see Figure 3 below)²². Lowland rain fed rice is the most competitive in terms of cost because the dark clay soils of the river valleys retain moisture and are rich in organic matter. They produce reasonable yields despite low use of modern inputs.

²¹National Rice Development Strategy (NRDS), MoFA, draft February 2009.

²² Bill and Melinda Gates Foundation Report, Overview of the Rice Value Chain in Burkina Faso, Ghana, Nigeria and Tanzania, September 18th 2012

Figure 3. Cost Comparison of Imported and Locally Milled Rice, 2012



Source: Bill and Melinda Gates Foundation Report, Overview of the Rice Value Chain in Burkina Faso, Ghana, Nigeria and Tanzania, September 18th 2012

However, the analysis in Figure 4 does not take into account the amount of labour hired on the farm, or production and marketing margins but even allowing for these costs, domestic rice should be able to outcompete imports so long as its quality is acceptable to the consumer. It is clear that the use of improved inputs, better agronomic practices and mechanisation services would increase productivity and incomes for rice farmers even further. Average yields vary from 2.5 to 4.2 MT/ha in the major season to 2.1 to 3.5 MT/ha during the minor season²³ which are good by regional standards but well below major international producers. They compare poorly with the 9.8 MT/ha for Egypt, 7 MT/ha for the U.S. and Japan, and 4 MT/ha for Vietnam²⁴.

The increase in Ghanaian rice production has come from an expansion of cultivated land and, especially, productivity. Total production of rice in Ghana was estimated about 481,000 MT (paddy) and 289,000 MT (milled rice) on 189,000 ha in 2012, with production growing by 71% and area planted growing by 28% since 2001²⁵. Average yields have increased from 2.0 MT in 2000 to 2.5 MT in 2012.

Production has been increasing at 9% p.a., one of the fastest growth rates of any major crop in Ghana. But as noted earlier, this has not been sufficient to keep pace with demand. For the future, the NRDS projects a substantial increase in the area under lowland rice and irrigated cultivation, accompanied by increased yields. Rice competes with alternative crops for lowland cultivation. As it is more profitable than most crops²⁶, it is likely that more farmers will switch to rice.

What is needed to further improve yields (and hence incomes) is far greater use of modern inputs, especially for lowland rice. The critical constraint at present is seed. The commercial seed market is severely underdeveloped, though it has attracted a lot of effort from government and donor initiatives. Before 2009, the amount of rice seed produced would only have been able to support activity on 5 per cent of area under cultivation²⁷. Table 3 shows the large spike in seed production after 2008. Most of the increase in production has come from government and donor projects but, given the low starting point, the per cent of improved seeds used remains below 10%. Jasmine 85, a perfumed rice able to compete against imports developed by the International Rice Research Institute, was officially released in 2009, and is gaining in popularity. However, it is still not cultivated widely as farmers are still not convinced that they will be compensated adequately for the cost of investing in seeds and other modern inputs.

Table 3. Production of rice seeds 2001-2011

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010 ²⁸	2011
Rice Seed Production (MT)	732	457	407	495	233	516	344	550	2,378	1,450	2,367
No. of varieties	4	3	3	3	4	8	4	>8	8	5	4
Rice Production ('000 MT)	253	280	239	241	236	249	185	301	391	492	463

Source: Seed data: Tripp, Robert, and Akwasi Mensah-Bonsu. "Ghana's Commercial Seed Sector." (2013); CountryStat.

Beyond seed, two other inputs come into play. One is the finance needed to pay for modern inputs and labour which is discussed under support functions below. The other is labour. In the main rainy season, rice competes against all the other crops being grown. Its intensity of labour use, however, can make labour a constraint to further expansion of rice cultivation. Timely planting, weeding and

²³ USAID Microreport #156, The Global Food Security Response: West African rice value chain analysis, Ghana rice study micro report. 2009

²⁴ USAID Microreport #156, The Global Food Security Response: West African rice value chain analysis, Ghana rice study micro report. 2009

²⁵ MoFA (2012), Agriculture in Ghana, Facts and Figures 2012

²⁶ Though it is much less profitable than yam with which it competes for lowland fields

²⁷ Tripp, Robert, and Akwasi Mensah-Bonsu. "Ghana's Commercial Seed Sector." (2013).

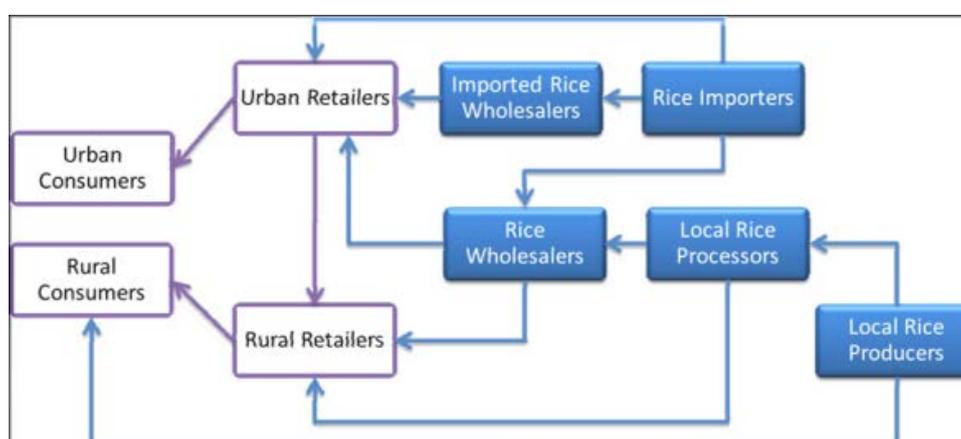
²⁸ Note: An additional 2,456 MT of seed were grown by MOFA Block Farms. Tripp, Robert, and Akwasi Mensah-Bonsu. "Ghana's Commercial Seed Sector." (2013).

especially harvesting and drying are key to producing good rice with low rates of broken grains. Greater mechanisation would help to address this constraint. The use of hired labour is not likely to fall as a result of mechanisation as it will require labour to be used in a timely manner alongside the harvester to collect, sort and dry. In fact, the need for timely use of labour may increase the amount of paid for labour as against shared labour.

Longer term, more investment is needed to bring more land under rice cultivation. One survey found that around the country "79% of rice area continuously cropped for the last 11 years or more."²⁹ That suggests that the pressure on lowland soils suited to rice is becoming intense. Investment is needed in irrigation and in soil quality using organic manure and compost.

The local value chain for rice has a large number of participants (Figure 5). Inputs are provided by agrochemical dealers and seed producers to smallholder farmers, though uptake by smallholder farmers is limited. Most farmers are dictated prices by local market women, who sometimes provide access to capital and credit as well as transportation services³⁰. Parboiling is done by women, who trade paddy. Bulking may be done by market women, or, if they are in the vicinity, by local millers³¹, though much of the milling is done on a pay per use basis. Some processors also work with wholesale importers to market rice locally.

Figure 6. Distribution network of rice in Ghana



Source: Amanor-Boadu, V. (2012). Rice price trends in Ghana (2006-2011). *Department of Agricultural Economics, Kansas State University*.

Milling techniques applied to locally produced rice vary by region. A lot of processing is done manually at the homestead, but results in end products of varying quality. For instance, in Tamale the whole stem is cut and is only roughly separated from the grain when most rice is harvested. The processed rice is brown in colour and may contain dirt particles. However in Bolgatanga, the panicle is cut directly, with much less foreign matter in the final product. The end product is white, and can be passed for imported rice³². However, the quality of rice produced is much inferior to imported rice. No

²⁹ Ragasa, C., Dankyi, A., Acheampong, P., Wiredu, A. N., Chapoto, A., Asamoah, M., & Tripp, R. (2013). Patterns of adoption of improved rice technologies in Ghana.

³⁰ Angelucci F., Asante-Poku A. and Anaadumba P., 2013. Analysis of incentives and disincentives for rice in Ghana. Technical notes series, MAFAP, FAO, Rome.

³¹ Angelucci F., Asante-Poku A. and Anaadumba P., 2013. Analysis of incentives and disincentives for rice in Ghana. Technical notes series, MAFAP, FAO, Rome.

³² Angelucci F., Asante-Poku A. and Anaadumba P., 2013. Analysis of incentives and disincentives for rice in Ghana. Technical notes series, MAFAP, FAO, Rome.

Grade 1 rice is produced in Ghana, while only 4% is Grade 2 and 83% is Grade 5³³. In contrast, 6% of imported rice is grade 1 and 51% is grade 2³⁴.

The import value chain is much simpler, and the limited number of intermediary actors helps limit costs. The main wholesale rice importers³⁵ distribute rice to wholesalers around the country (sometimes selling on a credit basis), who in turn sell produce to retail networks³⁶.

Table 4 shows that farmgate and wholesale prices have diverged. It is clear that the spike in global food prices that affected the urban wholesale level did transmit upstream to producers at the farm gate. However, since then, farm gate prices have fallen but wholesale prices have continued to rise despite a fall in the world market price for rice. This shows that the high-end segment of the market accounted for by imports is price inelastic.

Table 4. Wholesale and farmgate price trends for rice (2005-2010)

	2005	2006	2007	2008	2009	2010
Accra Wholesale prices (GHC/MT)	474.30	546.30	572.30	846.70	1026.50	1451.80
Tamale Farmgate prices (GHC//MT)	430.30	411.30	453.90	745.60	661.20	649.80

Source: Angelucci F., Asante-Poku A. and Anaadumba P., 2013. Analysis of incentives and disincentives for rice in Ghana. Technical notes series, MAFAP, FAO, Rome.

In fact, power in the value chain lies with wholesalers and importer/distributors. The presence of so few importers is explained by the need to ship rice in bulk by the ship or part shipload, which only a few firms can afford. Equally, domestic rice is wholesaled by large merchants and they command stronger market power than the women involved in bulking rice in the North. The huge disparity between farm gate and wholesale price cannot be explained by transport and handling costs. The fact is that wholesalers in Accra, Kumasi and Takoradi control the market for local rice and enjoy high margins³⁷. More and better channels need to be established between the farmer and the consumer if the latter is to obtain a higher share of the value created.

This is where the new mills may play a role. However, the danger is that the new mills may capture the value for themselves instead of passing it back to the producer. It is vital that that mills are made to compete for the supply of paddy from the farmer.

SECTION 5. ANALYSIS OF SUPPORT FUNCTIONS

5.1 RESEARCH

Research on rice has been conducted by a variety of actors, including the Crop Research Institute, SARI, WARDA (AfricaRice) and several universities around the country. About 80-90% of research by CRI and SARI is focused on developing and testing improved varieties³⁸. Several varieties of rice have been released based on seeds developed by the International Rice Research Institute and AfricaRice (namely the NERICA seeds). Seeds have been developed tailored to both upland and

³³ Angelucci F., Asante-Poku A. and Anaadumba P., 2013. Analysis of incentives and disincentives for rice in Ghana. Technical notes series, MAFAP, FAO, Rome.

³⁴ Angelucci F., Asante-Poku A. and Anaadumba P., 2013. Analysis of incentives and disincentives for rice in Ghana. Technical notes series, MAFAP, FAO, Rome.

³⁵ Finatrade, Olam, Stallion, Imexco, City Investment Group, Royal Bow Co. Ltd, CCTC, Cereal Investment Co. Ghana Ltd and Ezal Trading Ghana Ltd

³⁶ Angelucci F., Asante-Poku A. and Anaadumba P., 2013. Analysis of incentives and disincentives for rice in Ghana. Technical notes series, MAFAP, FAO, Rome.

³⁷ Gage, D., Bangnikon, J., Abeka-Afari, H., Hanif, C., Addaquay, J., Antwi, V., & Hale, A. (2012). The Market for Maize, Rice, Soy and Warehousing in Northern Ghana. *USAID/EAT/Fintract Inc. Project Report*, 27-34.

³⁸ Ragasa, C., Dankyi, A., Acheampong, P., Wiredu, A. N., Chapoto, A., Asamoah, M., & Tripp, R. (2013). Patterns of adoption of improved rice technologies in Ghana.

lowland ecologies, but exclusive upland varieties were only released in 2009³⁹. CRI and SARI also conduct testing on cultivation methods, timing and rate of applying fertiliser to improve yields, as well as land preparation, weeding, seed priming, spacing, transplanting and using the sawah system of planting. This is commended given that SARI is underfunded.

Much of this research has however failed to be disseminated or commercialised. The committees consisting of SARI and the extension agents responsible for dissemination are underfunded and rely on a few demonstration farms. The use of media is negligible. SARI has not developed sufficient partnerships with local seed growers to multiply so the supply of foundation seed is low. The major seed companies have also failed to develop an effective partnership with SARI. It has been left to a few progressive seed growers to supply the market for improve rice seed varieties. But they are usually too small to invest the sums needed to disseminate the benefits of using these varieties and to demonstrate to farmers how they should be grown. With seed a critical constraint, this is an area where MADE can make a major contribution.

5.2 KNOWLEDGE AND EXTENSION

Due to the need to change agricultural practices to grow modern varieties efficiently, rice farmers would benefit from regular contact with extension agents, learning about new techniques tailored to different varieties and sustainable management practices. However, the ratio of agents to rice farmers is high (1:3,000)⁴⁰, with limited reach to remote regions in the north.

Pilot programmes have shown what can be achieved. As part of the Japan International Cooperation Agency's rice project, extension services helped raise yields to 4.1tn/ha in the Ashanti region and 3.3tn/ha in the Northern region. The project introduced various post-harvest technologies including threshing, milling and packaging⁴¹. Support has also been provided effectively to farmers by the private sector. Amsig Resources, an agribusiness company, worked with over 82 farmer groups, 16 of which are women-led, amounting to nearly 4,700 farmers in total⁴². Its interventions focused on System of Rice Intensification, including creating nurseries, preparing fields, transplanting rice seedlings and harvest maintenance.

What is needed is to develop a media campaign to inform farmers of the changes in the market that are causing greater demand for modern, aromatic varieties, the package of inputs and good agricultural practices (GAP) to grow these varieties efficiently and post harvest techniques to minimise brokens. Such a campaign could form the basis of establishing public private partnerships between research institutions and private sector input suppliers and distributors. If the large new mills could be crowded in, they would provide the market power to forge powerful alliances between and within the public and private sectors. It is the emergence and launch of such a campaign and the forging of such alliances that MADE would facilitate.

5.3 FINANCE

Access to finance is a significant problem for smallholder farmers, processors and traders. High input costs associated with the growing of modern varieties call for greater use of capital which smaller farmers do not have. In most cases these farmers are unable to obtain finance from banks and microfinance institutions (MFIs) or those lucky enough to do so face high interest rates that make the overall production process uncompetitive. Small holders therefore resort to cheaper methods, such as

³⁹ Ragasa, C., Dankyi, A., Acheampong, P., Wiredu, A. N., Chapoto, A., Asamoah, M., & Tripp, R. (2013). Patterns of adoption of improved rice technologies in Ghana.

⁴⁰Al-Hassan, Seidu. *Technical efficiency of rice farmers in Northern Ghana*. No. RP_178. 2008.

⁴¹ JICA Presentation: <http://www.jica.go.jp/ghana/english/activities/c8h0vm00004bps0w-att/activity01.pdf>, Accessed February 2014

⁴² Feed the Future Website: <http://feedthefuture.gov/article/women-rice-farmers-partner-create-new-opportunities-ghana>, Accessed February 2014

retaining seeds and skimping on the use of mechanisation which, in the long run, produce lower yields, higher costs, lower quality and hence lower incomes.

The National Rice Development Strategy outlines the need to identify sources of credit for producers and local processors (namely through MFIs) and provide training support through the government and NGOs⁴³. However, this has made only limited headway, essentially through donor financed programmes.

Though the north has many rural banks and MFIs, most are undercapitalised and ill-equipped to make agricultural loans. Facilitating partnerships between the more capable and commercial banks who can provide them with wholesale finance, and training them in the cash flow requirements and success factors in rice production could help to reduce the information asymmetries that underlie this constraint.

The women par boilers that currently can afford to buy only limited quantities of rice and use inefficient technology could, with access to finance, both increase the scale of operations and invest in better technology. This requires that they are able to improve record keeping. Access to quality business development services (BDS) as well as familiarising the banks with the cash flow and economics of rice processing are needed to reduce information failures. Developing a market for leasing better parboiling and milling equipment would help them to reduce costs and improve the quality of the rice they produce. With better access to finance, they may be able to increase the credit they extend to farmers.

5.4 MECHANISATION

The Agricultural Mechanisation Services Enterprise Centres (AMSECs) programme was established to help smallholders gain access to mechanised services, by setting up credit facilities and co-ordinating with companies to purchase agricultural machinery. These have largely been ineffective. Instead, private tractor hire services have developed, most of which are based outside the North. The bimodal agriculture of the South makes tractor services far more economical than establishing such businesses in the North with its mono-modal rainy season. Hire services based in the South use the North to provide services when the South does not need them.

As a result, there is strong competition for the use of tractor services and farmers tend to give preference to the main crop they produce. So, land preparation, planting and harvesting of rice remains mainly labour based. There is a need to increase the supply of mechanisation services to the North. Leasing more tractors with specialist rice planting, weeding and harvesting equipment in tow could provide a viable solution. As noted earlier, this need not reduce the demand for paid labour.

SECTION 6. ANALYSIS OF POLICIES AND INSTITUTIONS

6.1 POLICIES & INSTITUTIONS

The NRDS is the main government initiative to support the rice subsector specifically, developed by MOFA, AGRA, CARD and JICA to cover a broad spectrum of intervention areas. NRDS was introduced in 2009 and aims to double rice production by 2018, with a cumulative annual growth rate of 10%⁴⁴. It aims to work with FBOs, the private sector, NGOs and donors to develop the industry. The NRDS strategy targets the seed system, fertiliser marketing and distribution, post-harvest practices and marketing, irrigation and water control, research and technology dissemination, community mobilisation and credit management⁴⁵. Its other objectives include promoting the consumption of local rice, enabling stakeholders to use rice by-products and promote the

⁴³ National Rice Development Strategy, 2009

⁴⁴ Ragasa, C., Dankyi, A., Acheampong, P., Wiredu, A. N., Chapoto, A., Asamoah, M., & Tripp, R. (2013). Patterns of adoption of improved rice technologies in Ghana.

⁴⁵ National Rice Development Strategy, 2009

dissemination of information and collaboration amongst the major stakeholders in the rice value chain⁴⁶.

Its implementing arm, the National Rice Task Force, differentiates its activities by working with three main groups of farmers: upland, lowland and irrigated land growers. Specific strategy directives include the “development of water control structures, integrated soil fertility management and improvement in rice varieties as well as post-harvest handling and value addition”⁴⁷.

The NRDS’s focus was mainly on programmatic interventions. The few policy initiatives it envisaged, such as working with traditional chiefs to enable land consolidation to form block farms has not made major headway. The Block Farm Programme, initiated in 2009, selected specific sites to pool resources and provide resources collectively to smallholder farmers, including mechanisation services, extension services, inputs and access to credit. Where they were formed, they were able to increase productivity, but they are few and far between. Figure 7, in the earlier section, shows the level of protection imposed on the rice imports is substantial, but has failed to make local rice significantly more competitive against imports due to quality problems.

Thus, the major reliance has been on general agricultural policy and specific donor programmes. Government policy has been supportive of agriculture generally, including rice. The Fertiliser Subsidy Programme aimed to encourage the use of fertiliser, as Ghana has one of the lowest rates of application in Africa. The programme aimed to return prices to 2007 levels and increase fertiliser application from 8 kg/ha to 20 kg/ha⁴⁸. 1.1 million vouchers were released, but only half were redeemed⁴⁹. In 2010, a waybill system was introduced, subsidising the transport and import costs of fertiliser. The government also introduced a 10% subsidy on rice seed⁵⁰. The policy has encouraged greater use of fertiliser but is considered wasteful. The vouchers were poorly targeted and the new regime has resulted in cheap fertiliser being illegally transported across the border. Cheap fertiliser and seeds are being captured by large farmers who least need the subsidy. Far better targeting and control are needed to make the subsidy schemes cost effective.

Government policy has aimed to create alternative markets to absorb smallholder production and provide a minimum floor price for farmers. Since its creation in 2010, the National Food Buffer Stock Company (NAFCO) has purchased rice from smallholders to create operational and emergency stocks⁵¹, operating in the vein of a parastatal by purchasing rice at a guaranteed price, absorbing excesses and distributing around the country and to other government entities. The policy has also proven to be hugely expensive and wasteful and is being scaled back.

Allied to wasteful or ineffective policy are poorly developed public institutions that make it difficult to implement all agricultural policy. As noted earlier, research and extension institutions are underfunded. As important as funding is governance over these institutions. In general, their management is not held to account for delivering results, nor has it been tasked to develop strategies to work with the private sector or civil society to leverage their capabilities and networks. Facilitating the involvement of the private sector in research and development and extension education will enable the dissemination and commercialisation of research findings and extension information to target beneficiaries.

⁴⁶ Angelucci F., Asante-Poku A. and Anaadumba P., 2013. Analysis of incentives and disincentives for rice in Ghana. Technical notes series, MAFAP, FAO, Rome.

⁴⁷ Angelucci F., Asante-Poku A. and Anaadumba P., 2013. Analysis of incentives and disincentives for rice in Ghana. Technical notes series, MAFAP, FAO, Rome.

⁴⁸ Angelucci F., Asante-Poku A. and Anaadumba P., 2013. Analysis of incentives and disincentives for rice in Ghana. Technical notes series, MAFAP, FAO, Rome.

⁴⁹ Angelucci F., Asante-Poku A. and Anaadumba P., 2013. Analysis of incentives and disincentives for rice in Ghana. Technical notes series, MAFAP, FAO, Rome.

⁵⁰ Tripp, Robert, and Akwasi Mensah-Bonsu. "Ghana's Commercial Seed Sector." (2013).

⁵¹ Angelucci F., Asante-Poku A. and Anaadumba P., 2013. Analysis of incentives and disincentives for rice in Ghana. Technical notes series, MAFAP, FAO, Rome.

That applies also to the Ghana Irrigation Development Authority (GIDA) which is responsible for dams and dugouts. As of April 2013, there were 22 public irrigation schemes across the country⁵². Most irrigation schemes are used for rice, but some also target vegetable cultivation as well. The Millennium Development Authority plans to add 5,300 ha of irrigated farmland to the existing 19,000ha, with support from several Asian nations, including China and multilateral organisations such as the FAO and World Bank. The problem is that most existing schemes are poorly maintained with water associations failing to pass on adequate water charges to GIDA to enable it to do preventative maintenance. GIDA itself is poorly funded.

6.2 DONOR PROGRAMMES

Over the past few years, MoFA, with funding from donors and development finance institutions has undertaken a host of rice projects. The Ghana Rice Inter-professional Body (GRIB) operated from 2008-2012, promoting the most suitable domestic varieties to be grown by farmers⁵³. The African Development Bank and JICA have funded several projects to extend access to rice seed⁵⁴. The Nerica Rice Dissemination Project, funded by the AfDB, aimed to improve both the quality and quantity of rice produced in Ghana, and was one of the driving forces behind the increase in seed production. One recent study found that the programme had a positive effect on incomes in Northern Ghana⁵⁵, but did not mention the feasibility for such a programme to be scaled up.

The Rice Sector Support Project (2008-2014) is implemented by MOFA with support by the Agence Francaise de Development (AFD). The collaboration aims to increase rice production on 6,000 ha across the Northern, Upper East, Upper West and northern Volta region by 16,250 MT of milled rice annually. It aims to achieve this through several mechanisms. The first is to develop the value chain in the north by land development of 75 valley bottoms, opening up credit lines to stakeholders, building the capacity of FBOs and Apex organisations and conducting research.

The major donor programme that has been addressing rice in the North is the Northern Rural Growth Program (NRGP) funded by AfDB and IFAD with a contribution from GoG through MoFA. NRGF aims to strengthen commodity chains, invest in infrastructure and improve access to finance. The model it has used to develop commodity chains is to attempt to develop a loose public private partnership by bringing together partner organisations to form commodity committees. These have largely proven ineffective. Moreover, it has appointed contractors (for profit and not for profit) to provide technical assistance. The quality of these has varied tremendously. In rice, there has been no attempt made to identify and address systemic constraints. It has made better progress on infrastructure and finance with the former consisting largely of grants which makes the sustainability of progress suspect. Its access to finance interventions include simple warehouse receipts and value chain financing, both of which appear promising. However, they remain pilots.

The major new programme on the horizon is the World Bank funded Ghana Commercial Agriculture Project (GCAP). This will give grants to nucleus farmers to grow rice using out-grower arrangements. The programme will take on the approach used by USAID's ADVANCE programme that is also due to enter a new phase. That programme followed a value chain approach and worked to support businesses in different parts of the chain. A new USAID programme, Agricultural Technology Transfer, run by IFDC will address equipment used to grow and process rice.

The question that the presence of so many large programmes addressing rice poses is how can MADE add value? The answer lies in the way that MADE will work. Its M4P informed approach will enable it to address systemic constraints addressing the underlying causes rather than symptoms. Most other projects are addressing symptoms by stimulating the supply of inputs or processing

⁵² Angelucci F., Asante-Poku A. and Anaadumba P., 2013. Analysis of incentives and disincentives for rice in Ghana. Technical notes series, MAFAP, FAO, Rome.

⁵³ Dzudzor, Makafui, Analysis of Rice Production and Opportunities in Ghana, AFEP.

⁵⁴ Tripp, Robert, and Akwasi Mensah-Bonsu. "Ghana's Commercial Seed Sector." (2013).

⁵⁵ Wiredu, Alexander Nimo, et al. "Impact of NERICA Adoption on Incomes of Rice-Producing Households in Northern Ghana." *Journal of Sustainable Development* 7.1 (2014): p167.

technology. As shown below, it is the whole rice market system that is not responding to market opportunities. Addressing that problem calls for systemic change. Additionally, MADE has the poor as the central target of what it does, not businesses or particular types of farmer. So, MADE will work with businesses but ensure that they compete with each other to deliver market outcomes in favour of the poor.

SECTION 7. IDENTIFICATION OF SYSTEMIC CONSTRAINTS

The symptoms which show that the rice market is not responsive to market trends are stark. The Northern rice markets system is stuck in low input/low output equilibrium producing varieties of rice that urban consumers do not like of a quality that is far inferior to imported rice. It is also easy to spot the key constraints such as the lack of breeder and foundation seed, poor post-harvest techniques, processing that is both high cost and produces poor quality products, the fact that market power rests with wholesalers in the large cities and that results in the farmer earning a low share of the final value created.

Looking beyond these symptoms at the market failures that give rise to them reveals the following systemic constraints:

- Undersupply of public goods (research, extension, irrigation). A number of improved varieties, GAP and knowledge of post-harvest techniques have been developed but not widely disseminated or commercialised. Public institutions are weak and they have failed to develop partnerships with private businesses with mutual interest. Lack of breeder and foundation seed and failure of SARI to develop a partnership with seed companies is the biggest symptom of this failure. The supply of extension to disseminate knowledge of GAP and underdeveloped irrigation facilities is inadequate. This weakens the whole input distribution system, the ability to convince farmers to grow improved varieties and to bring new land under rice cultivation.
- Failures in market information: Knowledge of market trends and what the market needs (varieties, grades, types of milling, price points) is weak in the North as farmers are remote from markets in the South. Farmers are yet to be convinced that the risk of switching to new varieties is worthwhile.
- Adverse market power: Market power is concentrated in the hands of wholesalers in the large cities who are not passing on the incentive provided by high consumer prices back to the farmers.
- Coordination failures prevent a concerted response. The presence of a large number of small actors, each with spot buying/selling relationships with actors up and down the value chain, combine with information failures to cause bottlenecks in the value chain. The invisible hand does not work well. So, supplying Avnash's demand for paddy requires a concerted response from research institutions, input suppliers, extension agents and farmers but such a response is yet to materialise.
- Financial market failures: Information needed to distinguish good borrowers from bad and risk averse financial institutions (banks, rural banks and MFIs) undermine access to finance. The rural banks and MFIs have the products and low transaction costs to potentially lend uncollateralised successfully but their failure to invest in training of staff and systems prevents them from realising that potential. Competition in the markets is limited by the presence of donor supported wholesale finance and a ready market for banks to lend to government and large corporates.
- Poor contract enforcement undermines contract growing. One way to address coordination and lack of access to finance is to promote contract growing. But contract enforcement in the North is very weak. So, side selling is common and has undermined pro-poor projects such as Masara N'Arziki that is using contract growing to develop maize.

SECTION 8. CONCLUSION

The growing and processing of rice to meet the surging demand for the crop in the South could transform growth and poverty in the North. With modern varieties, the crop provides a pathway out of poverty for farmers and employment opportunities for the poor to develop its nascent agricultural processing enterprises to increase value addition and hence growth. The North has competitive advantage over the South and is internationally competitive.

Fulfilling the potential rice holds for transforming the fortunes of the North requires addressing the systemic constraints through a combination of influencing, facilitation and judicial co-investment with the public and private sectors to promote pro-poor innovation. MADE can:

1. Facilitate the launch of a media campaign and use it to forge an alliance between SARI, input suppliers, Avnash and other large buyers.
2. Facilitate a stronger partnership between SARI, seed growers, seed companies and input distributors.
3. Use Avnash's need to build a supply chain to demonstrate new varieties and GAP to grow, harvest and dry them properly.
4. Help Avnash and other large buyers from the North (e.g. Premium Foods) develop an alternative to contract growing that supplies inputs to farmers and provides a secure market whilst avoiding side selling.
5. Incentivise BDS providers to provide training and business services to progressive trader/processors to enable them to grow their businesses and build more stable market relationships with wholesalers.
6. Facilitate the commercial banks to partner with rural banks and MFIs to address access to finance for farmers and fund progressive rice farmers and processing enterprises themselves.
7. Support the Ghana Rice Inter-Professional Body to provide a platform for providing information, coordination and advocacy.

ANNEX A: GENDER ANALYSIS

MADE Gender Market Screening Form		
Market name	RICE	Assessment Colour Code
1. Description	<p>In Ghana 306,153 households are involved in rice production, 90% of whom are in the North. 80% rice farmers in northern Ghana are small holders of which 50% of these are classified as viable rice growers because they are not resource constrained. Rice production is mostly rain-fed and labour intensive. Most farmers apply only traditional farming methods without equipment for production or harvesting resulting in poor quality and low yields. The better-off farmers cultivate rice during the dry season on irrigated fields.</p> <p>Rice is a fast growing market driven by lifestyle changes and incomes. 67% of rice consumed is imported.</p> <p>Recently there have been investments in large mills including Avnash in northern Ghana.</p>	
2. Gender sensitivity (How gender sensitive is this market?)	<p>Women play a major role in rice production – sowing, transplanting, weeding, harvesting, threshing, processing and marketing. Labour is provided by the poor, majority of them being women who are mostly paid in kind. The women depend on the rice from labour to support other needs such as home consumption, or selling to acquire other household and personal needs.</p> <p>About 95% of rice produced in the North is parboiled. This is done by women as an occupation that has been passed on from generation to generation. It is estimated that over 100,000 women participate in parboiling process as an important source of income. Women also dominate in rice trading.</p>	
3. Contribution to negative gender effects	<p>Basically there are two risk factors in this market: (1) Over mechanisation has the potential to reduce women's labour in rice farms and reduce income from labour due to processing. (2) Promotion of improved varieties can also reduce the supply of indigenous rice varieties for processing by women leading to reduced income. Additionally the potentially increased demand for improved varieties could reduce the market size of parboiled rice, thus reducing income of women processors.</p> <p>Inadequate access to finance reduces women's capability to acquire improved parboiling and processing technologies leading to poor quality processed rice, low price and low incomes.</p> <p>Women also lack information about the availability of support systems from NGOs and GoG and so they are not able to take advantage of available support to improve their productivity and income.</p>	
4. Opportunities to adapt	Promotion of indigenous rice varieties by highlighting the	



<p>to or mitigate these negative effects</p>	<p>nutritional values will change consumers' negative perception about parboiled rice. This could influence consumers' preference for local rice, leading to increased demand for parboiled rice, resulting in increased sales and income for women processors. Women can also participate in the opportunity presented by packaging in convenient pack sizes to meet consumer preferences and making products more accessible to the consumer.</p> <p>Promotion of good agronomic practices for production of local rice varieties has the potential of ensuring continuous availability of indigenous rice for parboiling and processing by women.</p> <p>Promoting women collectors and aggregators to feed Avnash could mitigate crowding out women from the rice value chain.</p> <p>Development of Business Development Services (BDS) to increase women's business participation through business incubation; and using lead women farmers and processors for mentorship to build and spread skills and knowledge.</p>	
<p>5. Gender promoting measures</p>	<p>Given the large role women play in parboiling, expanding on the traditional role of women in rice production and trading offers a promising opportunity. Facilitating improved access to finance could result in use of better equipment as well as higher quality inputs, leading to better quality rice. Greater access to rice trading during the dry season can provide additional income opportunities for women beyond labouring in rice fields, with increased economic returns.</p> <p>Creating forums to discuss benefits of improved technologies to the family and community at large could lead better adaptation</p>	
<p>6. Obligatory gender mitigating measures</p>	<p>Interventions in rice should comply with the following:</p> <ul style="list-style-type: none"> • Take account of potential displacement of women and offset these effects, either as part of the intervention or through other interventions. 	
<p>7. How will gender promotion measures be monitored?</p>	<p>There will be yearly assessment by the gender specialists supported by the lead market development specialist.</p>	
<p>Risk colour coding</p>	<p> Low</p> <p> Medium</p> <p> High</p>	

ANNEX B: ENVIRONMENT AND CLIMATE CHANGE ANALYSIS

Intervention/ component name		Rice	
1. Description		<p>This component will provide support services to enable rice farmers (especially smallholder farmers) have access to requisite inputs and services like new and improved seeds, fertiliser and agro chemicals, extension services, agro processing facilities and access to capital & credits.</p> <p>Mainly lowland rain-fed ecology, upland rain-fed ecology and irrigation ecology production of rice in the northern and Brong Ahafo regions</p>	Risk
Risk from Climate Change	2. Sensitivity of the intervention to risks from CC	<p>Highly sensitive to drought, however, flood-resistant: can remain almost entirely submerged in water and survive as long as the top of the crop is above water.</p> <p>Flood can indirectly damage irrigation infrastructures supporting dry season rice production such as dams, dikes etc.</p> <p>High temperatures induce high evapo-transpiration which can lead to salt accumulation affecting yields.</p>	Without adapt.
	3. Opportunities to adapt to these CC risks	<p>Research into early maturing varieties, heat, flood and drought resistant varieties, salinity and disease tolerance varieties – there may be some new market opportunities in seeds and agrochemical inputs.</p> <p>Development of irrigation facilities, coaching farmers on efficient use of water and water management practices.</p>	With Adapt.
CO₂/GHG emissions	4. Contribution of the intervention to CO₂/GHG risks	<p>Flooded rice field emit methane (CH₄) which is second in importance to CO₂ as a greenhouse gas.</p> <p>Burning of rice residues such as straw and husks contribute to greenhouse gas emission.</p> <p>Inefficient application of nitrogen fertiliser on rice farm promote could release nitrous oxide.</p>	Without Mit.
	5. Opportunities to mitigate the CO₂/GHG risks	<p>Rice cultivation is an important sequester of CO₂ from the atmosphere.</p> <p>Varietal differences could be used to lessen methane emission.</p> <p>Intermittent irrigation or alternating dry-wet irrigation could reduce CH₄ emission from rice-field.</p>	With Mit.
Environment	6. Risks to the environment from intervention	<p>Extraction of water for irrigation can reduce availability for other users. In larger irrigation schemes poor management and inadequate drainage can lead to salinisation or hydrological imbalance of system.</p> <p>Risks from increased and inefficient agrochemical use.</p>	Without Mit.

	7. Opportunities to mitigate the environment risks	<p>Researching and promoting sustainable riverbank cultivation techniques. LEISA (i.e. Low External Input and Sustainable Agriculture). Facilitating farmers' access to pumps can increase distance of cultivation from irrigation facilities, facilitating sustainable management. Promoting efficient use of water.</p> <p>Provision of good extension services and good agro practices.</p> <p>Straw as feed for livestock – bailing opportunity.</p>	With Mit.			
8. Summary		A relatively climate change resilient crop – but with dependence on access to dry season water. The environmental risks from production of greenhouse gas can be managed by improved agro practices.				
9. Obligatory mitigation or adaptation measures		Any market intervention on this crop which seems likely to lead to an increased area of cultivation will be accompanied by promotion of sustainable cultivation and irrigation techniques.				
10. Overall Risk assessment after mitigation		High from climate change, low from environmental impact from cultivation fields – but this should be able to be mitigated by improved practice.				
11. How will the mitigation/adaptation be monitored?		<p>A random sample of producers will be visited on an annual basis and the sustainability of their practice will be monitored in respect to:</p> <ol style="list-style-type: none"> 1. Prevention of soil erosion. 2. Prevention of burning of straw. 3. Safe use of agrochemicals. 4. Over-extraction of irrigation water to detriment of other users. 5. Continued availability of irrigation water. 				
Risk		Low		Medium		High
In order to be approved, none of the risk assessments after mitigation/adaptation (Rows 3, 5, 7 or 10) can be red.						

ANNEX C: POLITICAL ECONOMY ANALYSIS

MADE Political Economy Market Assessment

MARKET	RICE
<i>Stakeholder mapping</i>	
<p>1. Who are the “most influential” stakeholders or stakeholder groups in the market?</p>	<p>End consumers. Urban consumer markets represent about 76% of total rice consumption (both imported and local) in Ghana, but only 20% of locally grown rice is consumed by urban consumers. Greater Accra and Ashanti have the highest imported rice consumption, due to higher urbanisation, higher per capita income, and rising number of hotels and (fast food) restaurants. Perfumed, long grain rice (>5% broken) represents the premium segment of the market and is growing at a rate of 40% p.a., gaining at the expense of the non-perfumed variety. Imported rice dominates the premium segment, accounting for 85% of the market, with local rice constituting only 15% of the premium segment. Consumers are willing to pay a price premium of 113% for imported (Thai) premium rice over the local premium rice. Premium rice now accounts for 81% of overall rice imports. Imported rice is more commonly available on the market due to irregular supply of local rice. Local rice is rarely found in supermarket chains. Imported rice is publicised through effective advertising on television, radio, billboards, and print media throughout the country. MOFA, in conjunction with Engineers without Borders (Canada), undertook an intensive marketing campaign (2008-2009) to promote locally grown rice to consumers in Northern Ghana.</p> <p>Importers and Distributors. The imported rice distribution market is highly consolidated. A few major importers dominate the distribution channels, with Fintrade (35%) and OLAM (25%) capturing 60% of the imported rice market. Stallion (10%) and others (Imexco, Royal Bow Company Ltd, CCTC, Cereal Investment Co. Ghana Ltd, City Investment Group, and Ezal Trading Company Ghana Ltd) control the remainder. Importers typically distribute directly to wholesalers across the country and often sell on a credit basis. Some importers, including Fintrade, are also in the local rice supply chain, purchasing local aromatic rice from aggregators and processors and repackaging it for the local market.</p> <p>Aggregators. In contrast to the imported rice distribution market, the market and supply chain for locally grown rice is fragmented, with no major commercial player(s) dominating the channels of distribution. Individual aggregators, most of them southern-based market women, travel to the North to source rice for key markets. Rice produced in the North is absorbed mainly by the Ashanti (Kumasi) market. Commercial rice aggregators based in the North include BASA Agrobusiness (Tamale), CARD (Center for Agriculture and Rural Development, Tamale), SAVBAN Processing and Marketing Company.</p> <p>Institutional Buyers. The National Food Buffer Stock</p>



Company(NAFCO) was set up in 2009 by GoG/MoFA to purchase, store, and market grains (rice, maize, and soy beans) to facilitate food security in Ghana and has been purchasing rice from farmers in Northern Ghana since 2010. NAFCO guarantees farmers an assured income and market by offering a minimum guaranteed price and absorbing excess produce so as to reduce post-harvest losses. NAFCO purchases nearly 5 percent of local rice production in the SADA area, consequently creating a small market window for rice farmers in the area. Initially NAFCO did the purchasing itself. However, private licensed buying companies (LBCs) have now taken over the purchasing function. LBCs go to rice-producing communities to buy paddy during the harvesting period, when supply virtually outstrips demand. NAFCO then gives the paddy to seven lead processors for contract parboiling. These lead processors also engage 5,000 women to parboil it for NAFCO. Parboiling is done at different locations within the communities where these women are located. The parboiled paddy is milled at NAFCO's rice-processing mill, located in Tamale. The main target "market" for NAFCO is a school feeding program, Prison Service, and NADMO for disaster victims. It is government policy to procure staple grains locally for these programs.

World Food Program's Purchase for Progress (P4P) and others also currently buy rice (and maize and soybeans).

Processors and Millers. Most of the rice processing is done by small rice producers. In the North, rice is typically parboiled before it undergoes mill processing due to the harsher weather conditions that dry paddy; mills will often do both. **Single Women Group** is a small scale rice parboiling organisation in the region. There are a few relatively large commercial players in the processing/milling phase of the value chain. **Avnash**, which is 100% privately owned, has the largest rice processing mill in Ghana, located in Tamale. As of 2013, Avnash planned to construct 2 additional rice mills (500MT/day capacity) in Daboya (Northern Region) and Bolgatanga (Upper East). Avnash's plan is to supply its mills from rice contracted from its nucleus farmers who are linked to outgrowers and from networks of irrigated/rainfed smallholder farmers. Other commercial millers in the North include **Nassia Mills**, which processes rice for NAFCO, and **Lolandi**, which is owned by MOFA. **SAVBAN** is a processing and marketing company in Tamale, formed in 2012 through a partnership between Savannah Farmers Marketing Company (SFMC) and Bandaayili Farmers Union. There are 20 farmer organisations working with SAVBAN from the Bandaayili Farmers Union. These organizations have an average of about 50 members for a total of 1,000 farm households who can sell to SAVBAN. They deal in 3 main commodities: maize (60%), soybean (30%), and rice (10%). Other smaller processors interested in setting up mills in the North are Amsig Resources and Premium Food.

Growers/Producers. Rice is grown mainly by smallholder farmers, defined as farmers that produce rice on 2.5 hectares or less. These account for 80% of local rice production. There is a donor-supported (e.g., USAID/ADVANCE) trend toward rice production using nucleus farmer/FBO/outgrower schemes linked contractually to a commercial processor or miller.



	<p>Input suppliers. Key importers include Yara/Wienco, Chemico, Golden Stork, and Dizengoff and account for roughly 95% of all fertiliser imports. These importers are supported by over two dozen wholesalers and nearly 3000 retailers spread across country's districts. Most of these retailers are concentrated in towns or near peri-urban areas.</p> <p>Other enablers. Taking advantage of widespread mobile phone use in the country, a price information company, Esoko Limited, acting in partnership with USAID/ADVANCE, has piloted a project that enables farmers to receive SMS alerts both wholesale and retail prices. ICOUR offers a large pool of irrigated land.</p>
2. Is there a presence of legitimate and credible stakeholders?	Nationally, major importers like Finatrade and commercial processors like Avnash have credibility and legitimacy both within their respective value chains and in the eyes of policymakers. At the local/regional level, commercial processors, some FBOs, and some international and local NGOs with ongoing rice projects have influence with regional MOFA offices and other state agencies.
3. Is there a national politician or other influential political actor (e.g., national or regional "best farmer") who has a notable interest in or 'champions' the interests of any of the participants in this market?	There is no known individual champion of rice-farmer or industry interests. Rice-related FBOs sometimes serve as advocates of farmer interests with MMDAs at the local level. A credible, legitimate, grassroots-driven farmer organisation is lacking at the regional or national level.
4. Are there vested interests that can block, derail or sabotage policy and institutional change?	A well-organised and integrated local rice market, such as is contemplated by MADE, might diminish the market power of traders and correspondingly enhance the profitability of smallholder farmers. Even so, traders do not appear to have the power or influence collectively to block reform. In fact, depending on the particular interventions, even influential importers could be integrated into the domestic value chain in a manner that aligns their interests with those of smallholder/outgrower farmers and local processors/millers.
5. Are farmers in the market organized collectively? Is there a representative farmer based organisation?	There are several FBOs, principally at the district level. Most have emerged in response to or to take advantage of opportunities presented by particular GOG, donor, or NGO initiatives. In particular, MOFA encourages and uses FBOs to facilitate the provision of its extension services. Many, but not all, FBOs are registered with the Department of Cooperatives. Members of FBOs are more likely to benefit from government and NGO projects that provide support in the form of grants, credit, training and inputs because they prefer to provide support to groups rather than individuals. Some nucleus farmers/commercial processors also work through FBOs. FBOs do not typically market their produce collectively. MOFA maintains a database of FBOs.
<i>Institutional assessment</i>	
6. Are there any policies/regulations/norms in the market that could	There are several ongoing rice-related initiatives, policies, plans, and projects. The National Rice Development Strategy (NRDS) (2009-2018)

<p>limit or facilitate MADE's interventions?</p>	<p>aims to double domestic production by 2018 and enhance quality to stimulate demand for domestically produced rice. Also, under the government's Food and Agricultural Sector Development Policy (FASDEP II), rice is one of the priority food crops for food self-sufficiency. Over 20 rice-related projects, including the Rice Sector Support Project (2008-2014) have been initiated or are in the process of being implemented under FASDEP II. FASDEP II also includes a 50% fertilizer subsidy programme and a subsidized agricultural mechanization programme that are applicable to rice. As of the end of 2013, rice imports attracted the following duties and levies: 20% import duty; 12.5% VAT; 2.5% National Health Insurance Levy; 0.5% Export Development and Investment Fund Levy; 1% inspection fee; 0.5% ECOWAS Levy; and 0.4% Ghana Customs Network.</p>
<p>7. Which are the key public sector institutions, agencies and offices (national, regional, or local) relevant to the market?</p>	<p>The key public sector agencies relevant to the market are MOFA, MMDA, SARI, GIDA, ICOUR.</p>
<p>8. What platforms or forums are available and accessible to farmers, FBOs and other market participants to engage with policymakers or the policymaking process?</p>	<p>An Annual Northern Ghana Pre-Harvest Forum, which is already in its third year since inception, provides a platform for various market participants along the value chain to discuss contractual arrangements, prices and supply forecasts that will impact on their operations. The Agricultural Sector Working Group (ASWG) is a policy dialogue platform for engaging Government of Ghana (GoG) and Development Partners (DPs) on delivering on FASDEP II and other related agricultural development initiatives.</p>
<p>9. Do traditional authorities and other customary institutions play any role in the market?</p>	<p>Traditional authorities do not ordinarily play a role in the rice market, except insofar as land may be needed for large-scale commercial farming.</p>
<p>10. Are there capable private market participants in the market?</p>	<p>There are a small but growing number of private commercial operators in the processing/milling phase of the value chain, the most prominent of them being Avnash. There are also a small but growing number of capable outgrower/nucleus-farmer producers. Private operators dominate the input supply phase.</p>
<p><i>Summary</i></p>	
<p>Overall assessment</p>	<p>Current policy, regulatory and political environment is highly favourable to MADE intervention in the rice subsector. Rice enjoys explicit government policy support under FASDEP II and in the form of a National Rice Development Strategy. Recent cedi/foreign exchange crisis has increased political pressure to boost local rice production, quality, and marketing to reduce dependence on rising imports. Interests of large, influential investors in processing and linked back to producers via contract-based farming/outgrower schemes.</p>

ANNEX D: LIST OF RECENT AND ONGOING RELATED PROGRAMMES

Full name of project	Market	Organisation	Geographical areas of intervention	Start and end year	General Description
Feed the Future USAID Agriculture Technology Transfer	Maize, rice and soya	USAID	Northern Ghana	2013-2018	<p>The Agriculture Technology Transfer Project aims to assist with one of the key constraints to improved agricultural productivity and growth - the development, availability and adoption of agricultural technologies here in Northern Ghana. Over the next five years the activity plans to reach over 100,000 maize, rice, and soya farmers in Northern Ghana through public and private sector partners.</p> <p>In conjunction with today's official launch, the project organized a technology exhibition with private and public sector partners. The exhibition showcased small planting and threshing machines, drip irrigation and market information tools that will all contribute to increasing agricultural productivity.</p>
Agricultural Development and Value Chain Enhancement Project	Maize, rice and soybean	USAID	Northern Ghana	2009-2013	<p>The Agricultural Development and Value Chain Enhancement (ADVANCE) Program is a USAID-funded project, re-designed in 2011 to comply with USAID's new Feed the Future strategy, and implemented by a consortium of local and international partners led by ACDI/VOCA. The goal of ADVANCE is to facilitate a transformation of Ghana's agricultural sector in selected agricultural staples (maize, rice and soybean) to achieve a greater degree of food security among the rural population in the North while increasing competitiveness in the domestic markets.</p>
Agricultural Development and Value Chain Enhancement Project	Maize, rice and soya	USAID	Northern Ghana	2014-	<p>The United States Agency for International Development (USAID) is seeking applications for Assistance Agreements from all U.S. and non-U.S. qualified organizations for funding to support a program entitled "USAID Agricultural Development and Value Chain Enhancement Feed the Future Activity (referred to in this document as ADVANCE II)." The USAID Agricultural Development and Value Chain Enhancement Feed the Future Activity is a follow on to the current Feed the Future Agricultural Development and Value Chain Enhancement activity. This activity will be the primary mechanism for value chain support under USAID/Ghana's Feed the Future (FtF) strategy, with the objective of developing sustainable, private sector driven agricultural transformation that will increase rural household incomes.</p>



Ghana Greenfields Investment Programme	maize, rice, sorghum and soy	DFID	Northern Ghana (Tono and Bamboi)	2012-2015	DFID will provide £2.47 million over three years (2012 – 2015) through an Accountable Grant to AgDevco UK for the development of the Tono and Bamboi irrigation schemes in Northern Ghana. In addition to this, DFID will manage a technical assistance component of £150,000 to cover reviews during and at the end of the programme.
Rice Sector Support Project	Rice	AFD	Northern Ghana (Northern, Upper East, Upper West and Volta Regions)	2009-2013	<p>The overall objectives of the project are:</p> <ul style="list-style-type: none"> - To develop rice production in four administrative regions: Northern, Upper East, Upper West and Volta Regions. - To enhance national organisation of the rice sector through support to Ghana Rice Inter-professional Body (GRIB). - To implement some research activities in order to define cropping systems adapted to natural conditions of project areas.
Multinational Rice Dissemination Project	Rice	AfDB Group	Northern, Ashanti, Volta, Brong Ahafo	2005-2011	<p>The main goal of the Project is to contribute to poverty-reduction and food security, through enhanced access to high yielding NERICA upland rice varieties.</p> <p>The objective(s) of the Project are (i) to contribute to increasing locally produced rice for food security; and (ii) to conserve foreign exchange earnings through import substitution.</p>

