

Improving the Competitiveness and Marketability of Locally- Produced Rice in Ghana

I. Marketing of Rice in Ghana

Project R6688



*Department for International Development (DFID)
Crop Post Harvest Programme*

IMPROVING THE COMPETITIVENESS AND MARKETABILITY OF LOCALLY-PRODUCED RICE IN GHANA

**DEPARTMENT FOR INTERNATIONAL DEVELOPMENT
(DFID)**

CROP POST HARVEST PROGRAMME

PROJECT R6688

1. Marketing of Rice in Ghana

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Abbreviations & acronyms

| | |
|-----------|---|
| ADB | African Development Bank |
| CRI | Crop Research Institute |
| GFDC | Ghana Food Distribution Corporation |
| GIDA | Ghana Irrigation Development Authority |
| GLDB | Grain & Legume Development Board |
| GNPA | Ghana National Procurement Agency |
| JICA | Japan International Co-operation Agency |
| MOFA | Ministry of Food and Agriculture |
| NR | Northern Region |
| NRI | Natural Resources Institute |
| ODA | Overseas Development Administration |
| PB | Parboiled |
| ICOUR Ltd | The parastatal company managing Tolon and Vea Irrigation systems in NE region |
| PPMED | Policy planning , Monitoring and Evaluation Division of the Ministry of Food and Agriculture. |
| SARI | Savannah Agricultural Research Institute |
| UER | Upper East Region |
| UWR | Upper West Region |
| WARDA | West African Rice Development Authority |

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Exchange rate
as of December 1996

| | |
|----------------------|------------|
| One US dollar = | 1,750 cedi |
| One Pound sterling = | 2,800 cedi |

Weights and measures

| | |
|----------|---|
| Maxi bag | a gunny bag rated at about 100 kg, but weight of paddy from 84 to 120 kg. Usual form in which paddy sold by farmer. |
| Mini bag | usually 50 kg polypropylene bag, the usual form in which rice is sold |
| Tin | a metal dish in which rice and sometimes paddy is sold in markets. Weights vary enormously, but usually from 25 to 32 kg. |
| Cup | a blue band margarine tin cut open at the heaped capacity of approximately 480 grams |

SUMMARY

This study looks at the structure of the market for rice in Ghana, and sets out “to answer the question, to what extent the market system is responsible for the poor marketability of locally produced rice vis-à-vis imported rice”.

The study was carried out by NRI in collaboration with staff from GIDA to look at the irrigated schemes in the south of the country, with CRI to look at the inland valleys of the central area, and with SARI to look at the northern area inland valley production. The study was conducted from November 1996 to January 1997 using informal and semi-structured interviews with traders, farmers and millers.

The majority of rice is imported - approximately 200,000 tons as against less than 150,000 tons local production. The imported rice therefore sets the standard and price against which local rice is traded.

The main consumption areas for rice are the towns in the south - notably Accra and Kumasi. In the rural areas rice is grown as a cash crop, and most of it is sold, with little being retained for home consumption.

Irrigated rice production accounts for probably 8% of the area cultivated but contributes 25% or more of the production. The inland valleys of the central area constitute about 30,000 ha and the inland valleys of the northern area 55,000 ha. Yields in the inland valley average about 1.5 tonnes per ha.

IRRIGATED SCHEMES

In the irrigated schemes in the south farmers harvest by hand and thresh the paddy in the field into boxes or onto tarpaulins. The crop is then dried on cement drying floors, after which it is bagged, stored or sold.

In most cases, the paddy is sold to small traders who deal in volumes of 50 to 100 bags of rice per week during the main rice season. These traders, predominantly women, come and buy the crop, often whilst it is on the drying floor, or from the farmer's home. The rice is purchased by the maxi-bag, approximately 87 kg, but variable from bag to bag. The traders then take the rice to small local mills to convert the paddy into rice. These mills are of variable quality from engleburg hullers to more modern rubber roller Sataki machines. The out-turn was found to on average to be 62.5%. The rice is sold in minibags weighing approximately 48.5 kg.

In some irrigation schemes rice is sold to a large mill, either through a farmers' association, as in Dawhenya or direct by the farmers, as in Bontanga in the North. The large mills have more sophisticated processing machinery including a de-stoner prior to milling and a whitener after milling. The quality of the rice from these mills is comparable to the imported rice 15% broken.

The rice marketing system functions well in the irrigated areas. There are many traders competing for custom and many mills. The milling charges in the irrigated south were the most competitive in the country. Nevertheless, where farmer

organisations were not strong, as in Dawhenya, many farmers depended on a single trader, because they had to borrow money from them at interests varying from 15 to more than 50% over the season.

INLAND VALLEYS OF CENTRAL GHANA

Production on the inland valleys is from small scattered plots in variegated valley configurations. The *glaberima* (local red) variety is quite widespread as well as the *sativa* varieties.

Farmers may thresh their paddy immediately after harvest and store in bags in the house or may store rice on the panicle in special stores, threshing it only when ready to sell or consume. Threshing tends to be done on bare earth floors, and drying is similarly done on bare floors or roadside. The result is admixing of dirt and stones into the rice, reducing its quality and damaging the screens on the mills.

There are numerous forms of marketing. The main form is traders buying from the farmers' homestead, assembling crop and taking to local mills or town mills for processing. The mill is a major transaction point. A variant is where farmers take their paddy to the mill and process it into rice themselves. They then sell the rice at the mill to itinerant traders. In this case, the miller may provide credit to farmers.

INLAND VALLEYS OF NORTHERN GHANA

In northern Ghana, the drier climate in December and January means that the paddy has to be parboiled to prevent shattering when milling. Parboiling is a vast cottage industry of women buying small amounts of rice and parboiling a bag a day and then getting the paddy milled and selling the rice on the local market.

The parboiling adds to cost and so reduces the price that the farmer receives for his paddy. It was found that the rice from the Upper East and Upper West regions was generally of better quality than that from the Northern region, because the parboiling was better and the rice was cleaner and whiter, leading to a substantial premium on the price received.

The marketing system seemed to work efficiently with many traders and many mills allowing competition. No farmer reported having any problem in disposing of their crop. The percentage of the final retail price received by the farmer appeared high (75% in the south, 60% to 65% in the north). Traders received about 10% of the retail price and retailers similarly 10%. The cost of milling varied from 2% to 4%. Nevertheless, the system of using bags and tins for measuring meant there is room for a lot of variation in weights and farmers may actually receive a lower proportion of the final price, and the traders a higher proportion.

The marketing system does not seem to send price signals down to the farmer offering reward for quality. Prices at the farm level in any particular place, tend to be fixed, whatever the variety or quality. Better quality mills do produce a better quality rice, and there are price differentials operating in the markets for better quality rice, especially in the Upper East and Upper West Regions. Nevertheless, there is a limit on the quality due to the presence of stones which the small mills cannot remove. This renders local rice inferior to imported rice. The removal of stones from local rice is probably the single most important factor required to improve its marketability.

1 INTRODUCTION

1.1 Background to the study

With Ghana embracing structural adjustment and liberalisation of markets, there has been a massive surge in the importation of rice to meet demand. It has been observed in Ghana in particular, but in West Africa generally, that the price that local rice receives under these more liberalised conditions, tends to be lower than that of the imported product, and that this is because locally grown rice is generally perceived to be of inferior quality.

In the 1980s imported rice accounted for one-third to a half of the supply. Half of this was in the form of food aid¹. In the 1990s with liberalisation and reduced tariffs, imports grew and the market for rice leapt by 20% per annum. In 1996, imports were estimated at about 170,000 tons. Imported rice generally sells at a higher price than local, and is considered superior. Over time there has been a shift by importers to handle higher quality rice, as it sells faster.

Estimates for local rice production vary from 80,000² tonnes to over 200,000 tonnes (FAO). ODA (1996) estimate 140,000 tonnes. The amount traded is probably 80%, the balance being kept for seed or farmhold consumption. Thus locally produced rice probably accounts for 40% of the total marketed supply of rice in Ghana, and imported rice 60% of the supply.

Two major questions need to be asked. First, has Ghana in fact got a comparative advantage in growing rice, or would farmers be better off growing some other crop? Secondly, if a better quality of rice could be marketed and a better price received, would this materially affect the comparative advantage of the locally produced rice?

1.2 Rice Production

The following broad categories of rice are grown in Ghana:

- *Oryza glaberima*: is the common local species with many varieties, often reddish brown in colour and invariably short grained. These varieties are preferred for certain types of Ghanaian cuisine and are mainly grown in the central zone. *glaberima* varieties tend to sell at a lower price than the Asian types.
- *Oryza sativa*: varieties of this species were imported from Asia and *sativa* is a label that covers all the "improved" varieties grown in Ghana, of which there are many. Knowledge of the names is clearer on irrigation schemes, than in the wider rural economy. Further, the market's knowledge of varieties is more refined the further north one travels.

Rice has been grown since the 1920s in the Western and Volta regions. In 1963, the total area under rice cultivation was estimated at 32,000 ha. This more than doubled

¹ Timmins, Clarke & Bickersteth (1991)

² GLG-SOFRECO study (Draft 1996). This study felt that yields to calculate production were too high, also area estimates were considered very generous.

by 1975 to 78,000 ha, with most of this increase occurring in the northern area, where large mechanised farming accounted for more than 50% of total output. In the 1980s production ranged between 60,000 to 80,000 tons per year. Yields remained fairly low, and increased production resulted from increased area. In the period from the sixties through to the eighties, rice production was encouraged by subsidies on fertiliser, inputs and on machinery, and by restrictions on the importation of rice. Sometimes the administered price of imported rice was significantly lower than that of locally produced rice, but because it was in short supply, "free market" prices did not differentiate between imported and local rice.³

Currently the main areas of production are the Northern and Upper Eastern region, which account for more than 50% of the cultivated area.

Table 1 Area of Rice Production by region

| | |
|---------------|------------------|
| Western | 10,900 ha |
| Central | 600 ha |
| Eastern | 8,000 ha |
| Greater Accra | 700 ha |
| Volta | 7,800 ha |
| Ashanti | 6,400 ha |
| Brong-Ahafo | 6,700 ha |
| Northern | 24,000 ha |
| Upper West | 3,000 ha |
| Upper East | 31,800 ha |
| GHANA | 99,900 ha |

Source: PPMED for year 1995 quoted from GLG-SOFRECO (1996)

Figures on yield are probably over-optimistic, but the official statistics show a growth in production since 1990 from 81,000 tons to over 200,000 tons in 1996 - see table 1 over-leaf. The area under production increased only 10%! The GLG-SOFRECO⁴ suggests that total Ghanaian production is 81,000 tons whereas the ODA (1996) suggest production in the order of 150,000 tons.

³ Asuming-Brempong S (1987)

⁴ (draft 1996) op cit.

Table 1 **Rice Production in Ghana (tonnes)**

| | |
|------|---------|
| 1990 | 80,900 |
| 1991 | 150,900 |
| 1992 | 131,500 |
| 1993 | 157,400 |
| 1994 | 162,300 |
| 1995 | 201,720 |
| 1996 | 201,720 |

Source: FAO, Statistics

1.3 Rice Farming Systems

There are three basic rice farming systems identified in Ghana. These are:

- Irrigated schemes which can produce two crops per year: 7,000 ha
- Upland rice where the soil is not classed as hydromorphic and the plant depends on sufficient and continuous rain for its growth. 1,000 ha
- Inland Valleys where rice is rainfed, but where water is retained in the soil due to the hydromorphic nature of the soils and topography. 85,000 ha

The irrigated schemes are mainly in the south, but there are significant schemes also in the Northern region and North Eastern region. Although the area is relatively small, the irrigated areas make a significant contribution to rice production and yields average 4.5 tons per ha per season. Investments are planned for a further 4,000 ha to be developed, but the emphasis is increasingly for irrigated lands to support higher value vegetable and market garden crops.

Production of upland rice is not very significant. It was encouraged in the eighties during the period of high subsidies for mechanised farming. With the withdrawal of these subsidies, little of this type of land is utilised.

The predominant farming system is the 'inland valleys' system growing on hydromorphic soils. The central inland valley system has a bimodal rain pattern whereas the north has a mono-modal pattern.⁵

Inland Valleys of the central area: 30,000 ha with yield of 1.5 tons per ha.

Inland valleys of the northern area: 55,000 ha with yield of 1.5 to 2 t/ha.⁶

Government policy for rice production has varied over the years, but in general has emphasised area expansion through large-scale mechanised farming and the development of irrigated agriculture rather than the development of small-scale less-intensive farming. This has been done to pursue the aim of achieving self-sufficiency, national food security and the saving of foreign exchange.

⁵ For a fuller discussion on definition of inland valleys see GLG-SOFRECO 1996

⁶ op cit.

Currently, rice production is mainly in the hands of smallholders with holdings of less than 1 hectare. The large scale farms struggle to survive now, as input costs are high, and machinery in good working order is hard to come by.

1.4 Demand

The main areas of consumption are the towns. With rapid urbanisation, there has also been a rapid growth in demand for rice, as a "convenience" staple. Consumption of rice in the rural areas is minimal, with the possible exception of the Upper East, where the best local rice is retained for local consumption and the rest exported out of the region. A growing dependence of the urban poor on rice, may lead to the increasing political importance of the price of rice.⁷

In 1972/73, per capita consumption was estimated at 7.5 kg per annum (FAO), lower than for sorghum and millet. In 1996, annual consumption was estimated at 19 to 20 kg per capita. Vordzorgbe (1987) calculated the demand elasticity for rice in Ghana at 0.7 as compared to 0.4 for maize and -0.1 for cassava. As incomes rise therefore, the per capita consumption of rice can be expected to increase.

The GLG-SOFRECO study (Draft 1996) thought that the market for the local *glaberima* rice was separate from that of the imported rice, as the price varied greatly matching the supply characteristics of the variety - see table 2 below. The *sativa* varieties, on the other hand, are seen as substitutes for imported varieties, so that price variation due to seasonality is less, due to the damping effect of imports. The study also felt that there was little distinction in the market between parboiled and non-parboiled rice.

Timmins (1991) goes so far as suggesting that locally produced rice can in some respects be regarded as a different commodity to imported rice. In the north, the parboiled rice is preferred for *waache* and can "satisfy" the consumer in a way that the polished raw white rice does not. Informal surveys by Timmins showed a preference for the locally produced rice amongst rural inhabitants, northerners and lower income groups.

If the markets for locally produced parboiled and *glaberima* rice are separate to that for imported rice, will improvement in quality lead to an increase in price?

Market prices are set by the price of imported rice. There is currently a 25% duty and 15% sales tax on imported rice resulting in a total of 43.5% added to the CIF value.

⁷In Liberia the government of President Tolbert fell in 1980 after rice riots in Monrovia following the raising of the price of rice.

Table 2 Retail Prices for Rice (1996)

| Variety | Price (GLG-SOFRECO) October 1996 | Price (NRI) Kumasi market December 1996 |
|------------------------|--|--|
| Imported | <u>cedi per kg</u> | <u>cedi per cup (480 gm)</u> |
| 25% broken | c 1,000 | c 600 |
| whole grain | c 1,200 | c 800 |
| perfumed rice | c 1,400 | c1,000 |
| Local | | |
| Local Rice (ind mill) | c 850 | c 500 |
| Traditional Rice (Red) | c 620 to 1,100 at lean season | c 400 |

1.5 Marketing chains

Asuming-Brempong (1987) states that rice marketing has posed little problem in Ghana (except in cases where bad roads make it difficult to transport rice from producing to consuming centres) mainly because of ready markets for rice, especially in the urban centres.

Marketing of rice is mainly in the hands of small women traders, who buy rice at the village level and bring it to the towns for milling where it is on-sold to wholesale traders - again often women. There are many variations on this pattern a few of which are described in this report.

Parallel with this system, are "industrial mills" which purchase the rice and mill and polish the rice and wholesale it themselves. Such mills are mainly government owned and associated with irrigation schemes. Large mills also developed in the north to process production from the large mechanised farms. During the 80s they were handed over to the Ghana Food Distribution Corporation (GFDC) and have been lying idle ever since. GFDC currently have limited their purchases to Tamale, Bolgatanga and Afife.

1.6 Study objectives

The overall purpose of the project is to investigate the production economics and post harvest factors thought to be responsible for the poor marketability of locally produced rice in Ghana, compared with imported rice. This is a first step to redressing the situation. This marketing study is one of several component studies which will cover marketing systems, consumer preferences, price/quality issues and processing constraints. These papers will contribute to a post-harvest strategic planning document for the rice sub-sector in Ghana.

This study attempts to describe the marketing system from field to final consumer for the locally grown rice in the three systems - Irrigated in South, inland valleys of centre and inland valleys of northern area. In particular, quality aspects have been noted at all stages.

The concern is why local rice is considered of "poor quality", and can its "marketability" be improved? What has created the poor image for local rice?

- The variety grown?
- Poor processing and handling?
- Poor marketing and promotion of the product?

This report describes the marketing systems, the actors involved and the margins at each point in the marketing chain. It highlights those areas where improvements can be made in the marketing chain to enhance the value of locally produced rice.

1.7 Methods/collaborators

For the purpose of the study, the country was divided into 3 regions - covering the different farming systems. The south-east irrigated schemes were surveyed together with socio-economists of the Ghana Irrigation Development Authority (GIDA), the central belt of the country practising "inland valley systems" with Crop Research Institute (CRI), and the northern system inland valleys with the Savannah Agricultural Research Institute (SARI). The study was carried out in November and December 1996 by NRI economists collaborating with the above institutions. CRI and SARI continued field work into the first quarter of 1997.

Information was gathered by the use of semi-structured interviews of key informants, including rice farmers, rice wholesalers, rice retailers, rice millers and staff from GIDA, CRI and SARI. Direct observation of rice marketing, post-harvest practices, weights and measures and prices also provided important sources of information for describing the marketing system.

2. Rice Marketing System

2.1 Imported Rice

Rice is imported in large shipments usually in the form of polished rice in 50 kg polypropylene sacks. The marketing chain is quite short, with importers selling to distributors located in the main markets who sell to wholesalers or direct to consumers. Most of the rice is sold in Accra and the main towns of the Central and Ashanti region. Only very little goes to the north.

Three types of imported rice can be defined. Poorer quality (25% broken often of Vietnamese or Pakistan origin), good quality rice (Usually American and branded), and at the top end of the market, Thai fragrant rice, often pre-packaged in mini-sacks of 5 or 10 kg.

Importers and wholesalers reported that it could be difficult to sell the poorer quality rice. When a large consignment of such rice arrived, it would have a damping effect on existing stocks, and traders were sometime forced to sell this type of rice at a loss. The better quality rice sold faster, and demand for it was increasing.

2.2 Local rice

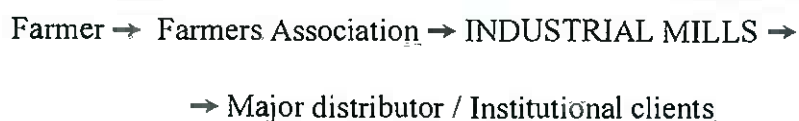
The marketing chain varies greatly in Ghana. Partly depending on location and partly on whether the rice is to be parboiled.

A. Irrigated Marketing System

In some of the irrigated areas, farmers have direct or indirect access to one of the few large mills. In Dawhenyi in the south, the Farmers Association sold direct to the GNPA which processed the rice themselves.

At Tolon in the North East, farmers were able to sell directly to the scheme management's own mill (ICOUR) during the off-season.⁸

This rice is then on-sold through the same network of distributors as imported rice or is sold to institutional clients - schools, army etc.



⁸ During the main season, the mill did not purchase rice as they had no parboiling facilities! In the past they had tried employing a lot of women with large cooking pots to parboil, but they did not try this again.

Not all farmers chose to sell to the schemes institutions, as they had made credit arrangements with small traders. They usually received a lower price though. The marketing system for these farmers was more akin to that outlined below.

B. Traditional Market Chain

The crop is purchased by village or itinerant women traders at the field or at the farmers home. The trader then transports the rice to a local mini-mill and has it processed. After milling it she will sell it to a wholesaler who may wholesale/retail locally or take it to re-wholesale in the larger city.

Farmer → Village trader → SMALL MILL → Itinerant Wholesaler →
→ Large city wholesaler / retailer

Within any one location, the farmgate price seemed to be fairly fixed. The price actually received by farmers varied greatly though because of credit arrangements and the opaque system of measuring rice - the non-standard maxi-bag which weighed from 87 kg up to 120 kg.

The traders usually have a wide choice of mini-mills to go to and there is a lot of competition between these small mills to secure business. This competition is usually on service, rather than price. Prices charged tend to be the same in any one area. Again though, discounts were given by some millers to favoured traders, but such discounts were discreet.

The notable feature of this system is that the miller is not trading, merely performing a service. The mill is a primary focus for trade, and millers encourage the conduct of trade on their premises so as to encourage the use of their mills. They may sometimes trade on behalf of traders, again, to retain their custom rather than for profit.

Village level buyers mill the rice and on-sell to itinerant traders who take it to market in the main towns.

C. Paddy milled in main town

A variant on this, is itinerant traders buying in the villages and transporting the paddy to the main towns and processing it, and selling ex-mill. This at first appears perverse, as these traders have to pay a higher transport cost per unit, than those transporting the more valuable rice. These traders argue that transport costs in Ghana are low, the quality of milling in the towns is better and that one can dispose of ones crop faster in the town. In addition, in Kumasi it was found that millers allowed traders to store their rice at the mill for up to a week.

Farmer → Itinerant Wholesaler → *transport to main town* →
→ MILL → Large city wholesaler / retailer

D. Parboiled Rice system

Parboiling rice is necessary during the main rice harvesting months in the North of the country from November to January, due to the low humidity experienced at this time of year.

Parboiling is usually done by local village women, who can only process small batches of about one bag a day. Alternatively, wholesalers and processors may purchase rice, again usually from women village assemblers, who will undertake the parboiling in the main town.

3. MARGINS AND PRICES

3.1 Farmer

The farmers in the irrigated schemes in the south receive the highest price and get the maximum yields. The GLG-SOFRECO study produced crop budgets for the irrigated system and the inland valleys system. It showed a return per ha of over 500,000 cedi for irrigated rice farming, but only 40,000 cedi for inland valley rice farming. With improved water harvesting and so improved yields they estimate that returns can increase to 350,000 per ha. The development of simple improved bunding is therefore at the heart of their proposed project for the Inland Valley Bottoms.

Currently, margins are very slim. The main "cash" cost for small farmers is harvesting, where they will have to pay usually a portion of the crop. Also farmers utilising tractor services usually repay with crop.

Table 3 over-leaf, sets out a breakdown of the costs and returns in the rice trade. At the bottom of the table it shows the proportion of final retail price that the different actors in the chain receive. In the south and central region farmers receive more than 70% of the retail price. In the north, as the rice has to be parboiled, farmers receive a margin of 60 to 65%. This is an extremely good margin for farmers to receive. The calculation of these margins are based on a bag of paddy weighing 87 kg, and that farmers receive the going price quoted. In reality, farmers may often supply a greater quantity of rice than the 87 kg, if the bags are old and patchy. If the farmer at Dawhenya supplies 5 kg extra, i.e. 93 kg in a maxibag, his proportion of the final price falls from 75% to 70%, and the trader's proportion rises from 11% to 16%. The figures need to be treated with caution, as weights were not always checked, and where, checked, samples were too small to deduce definite averages.

3.2 Trader

In Table 3 over-leaf, the costs and returns to the rice trader are laid out. It has been assumed that the out-turn is 62.5% throughout, that the weight of a bag of paddy is 87 kg and the standard weight of a mini-bag of rice is 48.5 kg. The trader's profit margin on a bag of rice is about 4,000 to 5,000 cedi. In Navrongo, though it was found to be much higher - nearly 11,000 cedi per bag. This margin has to cover the extra work involved in parboiling and drying the rice and having to take it back to the market to sell. It also reflects the high transaction cost of dealing with small volumes in the parboiling process. On the other hand it may also be due to a misreading of the out-turn. An out-turn of 55% rather than 62.5% reduces the margin to 5,400 cedi or 11% of the retail value. The out-turn of 62.5% is the estimate obtained in the southern irrigated area, and close to the usual international standard.

On the whole margins to traders appear to be in the region of 10%. The margins though tend to be hidden in the way paddy and rice are measured out. The use of the arm, or the hand in buying, adds to the volume. When selling, this measure is not given.

Table 3

Costs and Returns to RiceTrader

In cedi

| | South Irrigated. | | | Central | | North | |
|---|------------------|--------------|--------------|----------------------|----------------------|-----------------------|-----------------------|
| | Dawhenya | Asutsuare | Affric | Assin Praso | Kumasi | Tamale | Navarongo |
| PADDY : | | | | | | | |
| Yield: bags / ha | 57 | 57 | 46 | 17 | 17 | 17 | |
| Farmgate price / bag | 40,500 | 40,000 | 40,000 | 38,500 | 40,000 | 30,000 | 33,000 |
| TRADER'S COSTS | | | | | | | |
| For parboiler: | | | | | | | |
| Transport home | | | | | | | 900 |
| Firewood pr bag | | | | | | 2,000 | 2,000 |
| Transport to mill | | | 1,600 | 250 | 2,000 | 2,000 | 900 |
| Milling per maxi-bag | 1,000 | 1,500 | 1,500 | 2,150 Satake mill | 2,500 Satake mill | 1,670 trad. huller | 1,500 trad. huller |
| Cost of bag | 550 | 550 | 550 | | 200 | 200 | 200 |
| Transport to mkt | 700 | | | | | | 500 |
| Load & unloading | 600 | | | | | | |
| Market tolls | 150 | 150 | 150 | 150 | 150 | | 150 |
| Trader's total incremental cost: | 3,000 | 2,200 | 3,800 | 2,550 | 4,850 | 5,870 | 6,150 |
| CONVERSION TO RICE | | | | | | | |
| Standard weight of maxi-bag of paddy | | | | | | | |
| 87 kg | | | | | | | |
| Output | | | | | | | |
| 62.5% | | | | | | | |
| weight of rice | | | | | | | |
| 54 kg | | | | | | | |
| Standard weight of mini-bag of rice: | | | | | | | |
| 48.5 kg | | | | | | | |
| Ratio paddy to rice in their respective bags | note 1 | | | | | | |
| | 1.12 | 1.12 | 1.12 | 1.12 | 1.12 | 1.12 | 1.12 |
| Sale price per bag rice | 44,000 | 42,000 | 42,000 | 38,000 | 45,080 | 36,000 | 45,000 |
| Total value | 49,330 | 47,088 | 47,088 | | 50,541 | 40,361 | 50,451 |
| Profit margin of Trader | 5,830 | 4,888 | 3,288 | | 5,691 | 4,491 | 11,301 |
| Margins as percentages of retail price | | | | | | | |
| per kg | 1,000 | 960 | 960 | | 1,040 | 850 | 1,020 |
| Farmer | 74% | 77% | 77% | | 71% | 65% | 59% |
| Miller | 2% | 3% | 3% | | 4% | 4% | 3% |
| Trader | 11% | 9% | 6% | | 10% | 10% | 20% |
| Retailer | 9% | 10% | 10% | | 11% | 13% | 9% |
| Other | 4% | 1% | 4% | | 4% | 9% | 8% |
| Total | 100% | 100% | 100% | | 100% | 100% | 100% |

NOTES

- 1 One maxi-bag of paddy x the output gives the weight of rice
The weight of the rice divided by standard mini-bag of rice shows
how many bags of rice are produced from a maxi-bag of paddy

Out-turn is influenced by a number of factors:

- The moisture content. If too dry, the grain crumbles on milling, resulting in loss.
- The variety, different varieties have different ratios of grain to husk.

Measurement

Overall then, the system can be said to be fair although the imprecision of the weights and measures can change the aspect of the margins considerably. A bag may take 40 bowls to make 100 kg, on the basis of a 2.5 kg bowl. If the bowl actually only measures 2.45 kg, then 40 bowls-worth will save the trader 2 kg, worth 1,500 to 2,000 cedi. That can increase the profit margin by 30 to 40%. It is said that when a trader is buying, she will use an old bag to pour in the farmers grain. The bags age and patches allow it to take a greater volume adding 5 to 7 kg over a new bag. When selling by the bag, the trader is happy to sell in a new bag that doesn't show the same flexible generosity.

[see photographs in appendix 1]

Because of the gains that can be made in re-bagging, it can occur quite often. In Navrongo, it was observed that farmers brought their sacks of paddy to the market. The market women would buy by the bowl, measuring with a supportive arm around the rim of the bowl. The rice would then have to be bagged to transport to the home to parboil. After parboiling it is re-bagged and taken to a mill. After milling, it is re-bagged and taken to the wholesale market. At the wholesale market it is taken out of bags and displayed in basins to be sold by bowl measures (40 to a jute sack), and then transferred to the buyer's bag.

The system does suffer from a high number of transactions and a continuum of bagging and re-bagging, which is time consuming. On the other hand, the existence of many assembly points and many traders and milling points makes for a very efficient distribution system from the farmers point of view, and farmers had no problem of disposing of their crop.

3.3 Millers

The cost of milling represents between 2 and 4% of the retail price. In the irrigated south, milling charges were 1,500 per minibag of rice where diesel power was required or 1,000 per kg for mills using electricity. These milling rates were considerably lower than those obtaining in Kumasi and the north. Millers in Dawhenya said they were facing competition from the GNPA buying and milling operation.

Although mill owners were unsure of their costs and monthly throughput, based on the costs that could be obtained table 4 over-leaf was put together showing the costs and returns to typical small rice mills. The annual throughput of a mill can vary greatly. In the irrigated area, two crops a year can result in better utilisation. The better and more active mill owners though should be able to work for 6 to 8 months of the year with a monthly throughput of 500 to 600 bags.

Table 4 Costs and Returns to Small Rice Millers of about 200 kg per hour rice in thousands of cedi

| ASSUMPTIONS | | | <u>South</u> | <u>Kumasi</u> | <u>Bolgatanga</u> |
|---------------------------------------|-----------------------|-----------------|--------------|----------------|------------------------------|
| No of bags per day | | | 20 | 25 | 20 |
| Total months operating: | | | 12 | 6 | 8 |
| Total no of bags per month: | | | 500 | 625 | 500 |
| per year: | | | 6,000 | 3,750 | 4,000 |
| Capital charge: | Cost | | | Monthly | |
| | <u>Total</u> | <u>per year</u> | | | |
| Building | 10,000 | 500 | 42 | 42 | 10 |
| Mill | 7,300 | 730 | 61 | 61 | 10 |
| electric motor | 1,000 | 100 | 8 | 8 | |
| Diesel generator | 2,000 | 200 | | | 25 |
| Monthly capital charge/ working month | | | <u>111</u> | <u>111</u> | <u>45</u> |
| Recurrnt cost | | | | | |
| Electricity | 0.32 | per bag | 160 | 200 | |
| Fuel and oil | 0.60 | per bag | | | 300 |
| Labour | | | 240 | 400 | 100 |
| Spare parts of machinery | | | 100 | 370 | 270 |
| Total monthly cost | | | 611 | 1,081 | 715 |
| Taxes and fees | | | <u>25</u> | <u>31</u> | <u>25</u> |
| total recurrent cost | | | <u>636</u> | <u>1,112</u> | <u>740</u> |
| INCOME | | | | | |
| Number bags processed per month: | | | 500 | 625 | 500 |
| Tons of rice per month: | | | 25 | 31 | 25 |
| Milling charge: | <u>charge per bag</u> | | | | |
| South | 1,000 | | 500 | | |
| Kumasi | 2,400 | | | 1,500 | |
| Bolgatanga | 1,660 | | | | 830 |
| Sale of bran | 3,000 | | <u>300</u> | <u>375</u> | <u>150</u> |
| Total income | | | <u>800</u> | <u>1,875</u> | <u>980</u> |
| | | | | | * note lower price in North. |
| Margin per month: | | | <u>164</u> | <u>763</u> | <u>240</u> |
| | | | 26% | 69% | 32% |

Note: The mills in the north are old and cheap and cost of spares is main running cost. In addition they do not use much labour.

The capital cost of a mill varies greatly depending on whether the equipment was new or old. Second hand mills could be purchased for about half to one million for an old huller type, and up to \$10,000 for a new Sataki mill. The buildings in which mills were housed varied from solid constructions, to temporary shacks, depending often on the status of ownership of the land. The depreciation cost of fixed assets is to a great extent offset by other crops processed - notably maize milling.

The Average Cost of milling one bag of paddy is estimated to be between 1,000 to 1,700 cedi. The major costs are labour, spares and fuel. Estimates for spare parts ranged greatly, but anywhere between 200 to 400,000 per month. The major item of expense being the filter which had to be replaced every 3 or 4 days at a cost of 50,000 cedi per pair, due to damage from stones. [see photographs in appendix 1]

The milling charges in each location appeared to be the same. Milling charges between locations vary enormously. In the irrigated south charges are as low as 1,200 cedi per mini-bag of rice. In Kumasi rates are 1,500 per 30 kg tin equivalent to 2,300 cedi per mini-bag of rice. It did not appear that Kumasi had higher costs, and so Kumasi traders appear to make much higher profits - 80% as against 18% in the south. One miller in Assin Prasso estimate that his profit was 50%.

3.4 Transporters

The major road network in Ghana is good, with the main highway from Accra to Techiman tarmaced. The feeder roads though suffer during the rainy season, and can make rice marketing difficult.

Transport is in the hands of private operators and freight rates are competitive. Local transport tends to be smaller lorries 3 to 5 tonnes or pick-ups, longer haul transport will be 7 tonne lorries or above. Transport charges vary according to the load size. Larger load sizes enable traders to pay a lower rate per bag, but it is not always possible to realise scale economies in this way. Transport is generally hired by traders and may be in the form of larger 'cargo' trucks or smaller Datsun minibuses, or even taxis. It should be noted though that fuel is cheap in Ghana and transport rates are comparatively low.

Typical Transport Costs Quoted in the south east

| Journey | Estimated distance | Cost quoted per maxibag | Rate per maxibag per km |
|-------------------|--------------------|-------------------------|-------------------------|
| Afife-Ashaiman | 130 kms | ¢1600 | ¢12.3 |
| Dawhenya-Ashaiman | 16 kms | ¢500 | ¢31.3 |
| Dawhenya-Accra | 50 kms | ¢700 | ¢14.0 |
| Ashaiman-Accra | 35 kms | ¢500-¢1000 | ¢14.3 - ¢28.6 |
| Asutsuare-Accra | 90 kms | ¢800 | ¢8.9 |
| Asutsuare-Ada | 100 kms | ¢1000 | ¢10.0 |
| Asutsuare-Accra | 90 kms | ¢800 | ¢8.9 |

3.5 Other costs

Loading and Unloading Costs:

Frequently loading costs are included in transport costs. However, unloading usually results in charges for traders. Figures quoted for loading and unloading charges ranged between ₵100 to ₵600 per bag.

Bagging

Bagging is not a major component of marketing costs. Traders generally make paddy purchases using their own jute 'maxibags' which cost ₵1200 each but generally last for periods of up to three years. The jute maxibags are also repaired frequently in order to extend their life (and increase the capacity). Sales of milled rice are generally made in fertiliser type sacks which contain around 50kg. These bags cost ₵350 to ₵600, depending on their condition. Some wholesale traders sell the bag with the rice, while other wholesalers who supply market retailers will collect used sacks from their customers for reuse.

3.6 Retailers

Retailers in the outdoor and roadside markets make a margin of about 9% to 10%. Retailing usually takes the form of sale by volume measures based on heaped reused empty tins or bowls, with rice packaged in small plastic bags following measuring which is undertaken in front of the customer. The most widespread measures observed were reused margarine tins which contained either a cup (480 g) or a half-cup (260g). Other retailing measures used in the Afife area in Volta region were the 20 cm enamel tin bowl (weight 3,000g) and two other plastic bowl measures (weight of the smaller measure = 720g, larger size weight unknown).

Retailers at the market centres observed in Accra, Ashaiman and the southern part of the country commonly sell a range of rice at different prices reflecting differing grades and colours. Commonly, a retailer will have a selection of three or four imported rice at different prices, along with a local rice usually originating in one of the irrigation schemes. Retailers purchase imported rice from wholesale shops, and local rice from market women who usually deliver direct. Rice is commonly supplied on credit in this manner allowing retailers around two weeks before payment. During periods of high demand retailers may need to pay cash to secure supplies from traders, and also may collect rice from the mills.

Retail prices for local and imported rice are taken at various locations are given in Appendix 1 page 14. Some low grade imported rice is retails below the price of Ghanaian produced rice.

Rice is also retailed in cooked form to schoolchildren, and in the form of waache, which is a fairly sticky Ghanaian rice dish, served with sauce.

4. PRICES AND RICE TRADE FLOWS

If imported rice is the benchmark against which locally produced rice is priced, then one would expect that the further from Accra, the higher the cost of imported rice, and so the higher the price obtained for local rice. On the other hand, if the main market for rice is Accra and the major urban centres of the south, then local rice would need to be selling at a sufficiently low price in the growing areas to allow for adequate margins for it to be transported to the main consumer markets. Figure 1 below, shows the difference between the wholesale price for rice in Accra and up-country locations. These figures were obtained from the Ministry of Agriculture for a period of one year (95/96). Bolga rice and Kumasi rice appear to sell at a premium rice on the Accra market, whereas prices for Techiman seem to fluctuate alternately above and below the Accra price. Techiman is the main market for rice coming from the north for sale in the southern part of the country. Rice in Tamale and Koforidua (near to Accra) though, are consistently below the Accra price suggesting potential for rice to move from these centres to the Accra market. A further reason for the lower price for northern rice is that it is parboiled and considered inferior by consumers in the south of Ghana.

Figure 1 over-leaf shows the monthly price of rice in different regional markets in 1995 and 1996. At first the price differentials between the markets appear perverse. Why should Kumasi rice and Bolga rice be more expensive than Tamale rice? Is it because we are looking at different quality or different types rice? How reliable is the data? The data is probably not very good, and must be treated with caution, especially, the extreme variation in prices. The overall trends probably reflect the true picture.

It was noted that in the south east, that much of the local rice was being retailed side by side with imported rice. In Kumasi, in the centre of the country, more than 90% of the rice in the market was imported rice. In Tamale market, 70% of the rice was local rice and in Bolga 92% of the rice was local.

4.1 Imported Rice

If imported rice represent 60% or more of the traded supply, then the month by month level of imports will have a great deal of influence on price levels, which will dampen the seasonally induced fluctuation in locally produced rice.

The importation of rice is in the hands of a few big companies, that know each other and the market well. The economics of importing dictate minimum consignments of 4,000 to 5,000 tons. Each importer tries to time the landing of their rice to coincide with a shortage in the market. If able to time it right, profits of 35% or more can be made. On average importers expect to make 10 to 15%, but must be prepared to lose on some consignments.

Regional differential in wholesale price of rice

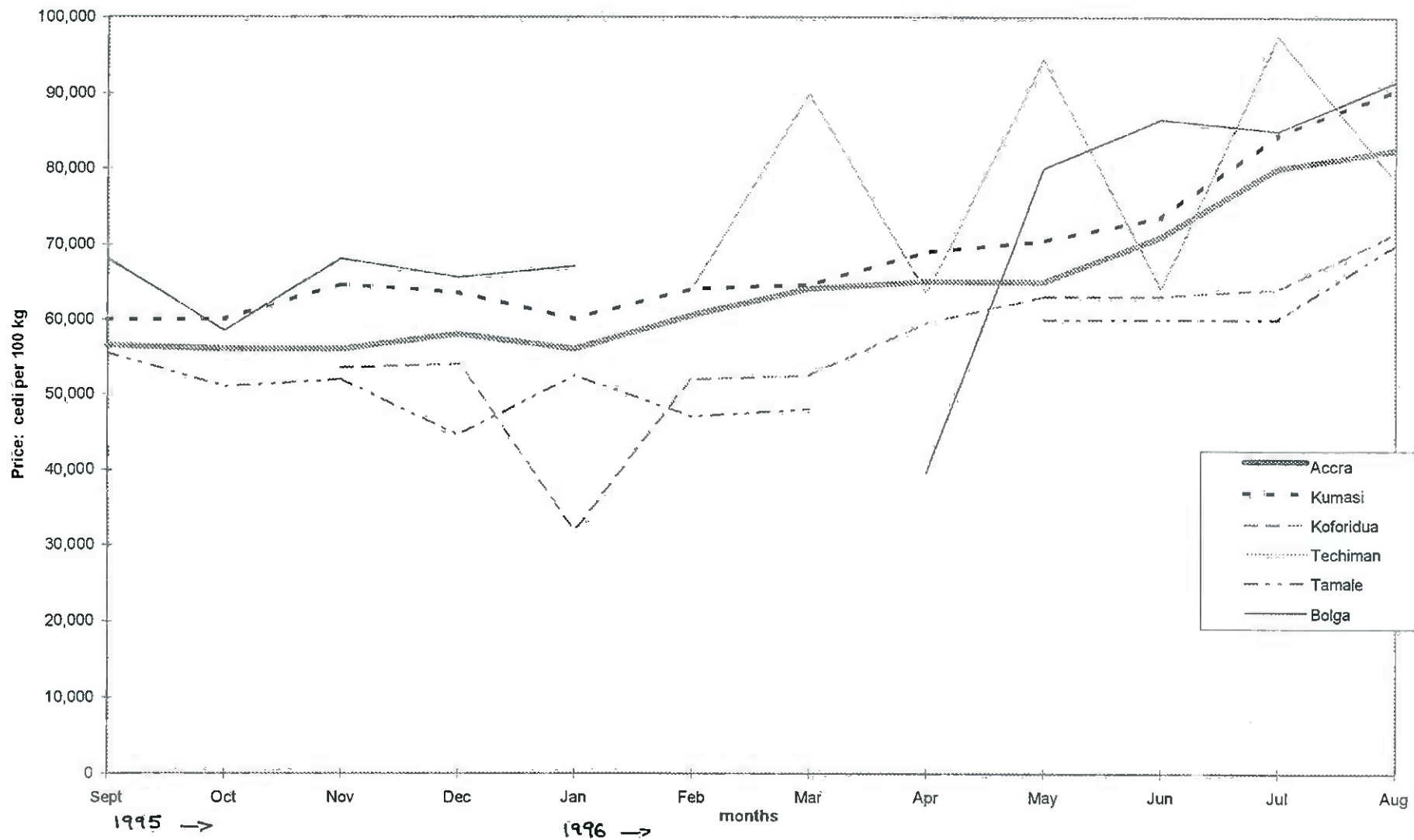


Figure 1:

Rice importers and traders handling imported rice notice that there is an increase in demand prior to Christmas, otherwise, they do not notice any seasonality. They also note that demand is stronger for the better quality types of rice and especially the perfumed rice. Brand loyalty is strong, and some importers are able to sell rice consistently under their own label.

The price for US Lucky brand (50 kg bag) were as follows in December 96:

| | Accra | Kumasi | Tamale |
|---------|--------|--------|--------|
| US Rice | 62,000 | 65,000 | 68,000 |

It should also be noted that merchants up-country dealing in imported rice, get the best freight rates as they move 100 to 200 bag consignments at a time.

4.2 Irrigated Schemes in South

The majority of rice produced in the irrigated area of the south-east is consumed in the Accra, Ashaiman and Tema. In addition, a proportion of the rice produced is marketed in the surrounding area usually by local market traders operating at a relatively smaller scale.

The irrigated rice sells at the lower end of the market. One or two imported rice brands do sell cheaper. Nonetheless, the market for Ghanaian irrigated rice does not appear to be constrained - if there were more production, it could most definitely find a market at the right price. Improvements in irrigated rice production and market practices, which would improve quality, would certainly enable Ghanaian rice to compete more effectively with imported rice.

From the national point of view though, realising the potential of rice production in inland valleys may be the most efficient means of promoting domestic production.

4.3 Inland Valley Central Area

Rice from Brong Ahafo goes to Kumasi and to Obwasi (a mining town with a high concentration of northerners).

It appears that paddy grown in the northern part of Western region and Eastern Ashanti is going to Kumasi market for processing. Paddy from south Ashanti is going to the coast. Rice grown on the eastern side of Ashanti and Volta goes to Accra market.

4.4 Northern Inland Valleys

The best quality rice from inland valley production comes from the Upper East. The best rice is retained for local consumption and sold in Navrongo, and thereafter sold to Bolgatanga. The rice then moves southwards to Tamale and a proportion is

consumed in the market towns on the way south. The major exit market for northern rice is Techiman market.

5. ISSUES RELATING TO QUALITY

5.1 Farmer level

The main stimulus to improved quality is for a better price to be paid for quality. At the farm level, quality is affected by the variety grown, purity of the seed, threshing and drying methods employed.

Generally it was found that in any one area, the farm-gate price was the same, whatever the quality or variety. On irrigation schemes there was a premium paid for some varieties. Outside irrigation schemes, knowledge of varieties and seed purity was greatly reduced. At first sight it would appear that there is little incentive for the farmer to improve his practices, as poor produce is not difficult to sell.

Variety & seed

Different varieties have different eating qualities. Also, different varieties may be more or less difficult to process in terms of threshing (*Glaberima* hard), or to mill. Farmers preference for variety will be determined by the market price they can obtain, the yield they expect and the price they hope to obtain. In Navrongo, the following prices prevailed for these varieties in the market. At the farmgate though, the same price was offered for all varieties.

| | |
|---------|------------------------------|
| 90 days | 3,000 cedi per bowl (2.5 kg) |
| Abidjan | 2,800 |
| IR8 | 2,600 |

Although IR8 had the lowest price at this season, it is the favoured crop at Tonio irrigation scheme during the dry season, as it is a better yielder than the other varieties.

Harvesting

Harvesting on time is critical to quality, especially for some varieties. Late harvesting can allow "volunteers" to grow up and "black seed" to appear in the rice. Harvesting when the paddy is still wet can lead to mould forming, and problems in drying.

Traders report that rice harvested by Combine harvesters result in more broken grains

Threshing

Under the inland valley system, most of the paddy is threshed on the bare earth, allowing dirt to be picked up. This can lead to problems in the threshing and the presence of stones in the rice. In the irrigated schemes in the south, boxes or tarpaulins or both were employed in threshing.

Drying

The drying of paddy is often poor. Wet paddy is larger than drier paddy, so farmers are keen to sell the paddy as wet as possible. The milling of wet paddy leads to high breakage's of grain and a lower out-turn. This may not bother the miller, as more bran means more profit for him in the sale of bran. Hence trader interest in buying from the drying floor.

Drying on poor quality drying floors can lead to more dirt and foreign matter being picked up.

Winnowing

As there is no grading system in the purchase of paddy, the farmer increases the volume sold if he does not clean out the chaff thoroughly. The farm level trader buying paddy though, is concerned to get clean paddy, to improve the out-turn of paddy to rice.

5.2 Processing**PARBOILING (in the north)**

Parboiling is carried out in small batches of one bag of paddy at a time. Proper control of the fire is critical and ensuring even spread of the heat. The women in the North East and North West, and especially in Navrongo were considered more expert in this. The result was whiter rice, that fetched a higher price.

Drying after parboiling is also critical, and a clean drying floor is essential. The stockade type houses of the North East generally had cleaner drying floors. The large mill at Tono had no parboiling facility, so could not process the crop harvested in December.

Milling

The vast majority of rice is processed by mini-mills with a capacity of less than half a ton an hour (5 bags an hour).

Direct observations suggest that the mills suffer frequent and chronic maintenance problems. Many of the mills would patch up their sieves by welding, and adapt car springs to make shafts. Other mill owners more concerned about quality would insist on using the genuine parts. [see photos in appendix 5]

The use of the very simple "huller-type" machines for milling paddy also appears to result in a lower quality of milled product with the presence of chaff and paddy grains. Out-turn is estimated at 55 to 60% and grading would be equivalent to 35% broken or higher

The more advanced Sataki mini-mills use rubber rollers and separate the chaff from the bran. The rice produced is therefore cleaner and better and does not require further winnowing. Also a better out-turn can be expected 62 to 65%. These mills are most common in the south of the country.

Stones

The presence of stones in the rice though results in frequent and expensive damage. This did not appear to be a major problem in the irrigated areas in the south, probably because of the use of tarpaulins for threshing, and the existence of good concrete drying floors.

In the Inland valleys though, the existence of stones and dust was attributed to the method of threshing on the bare soil and drying on poor and broken drying floors. Mill owners claimed to have to change their screens every two or three days, due to the damage that the stones caused, at a cost of 50,000 to 70,000 cedi a time. Interestingly, ICOUR, the company that manages rice milling in Tono irrigation scheme, have a destoner machine and only change their screens on their industrial mill every 6 months.

5.3 Consumer Preference

Cooking Quality

A number of respondents mentioned that a key problem with the local rice is the hardness on cooking. Some also mentioned that the rice can have a high starch content which is not appealing to consumers.

Colour was seen as a key indicator of quality by traders. The whiter the better the product. Despite this fact, the mill at Tono reported not “polishing” the rice, because the effect of polishing or whitening is to reduce the volume of rice by 3%.

The major criticism though was that people did not like biting on stones and almost all rice in the inland valley system had some stones! Imported rice was stone-free. Irrigated rice sold to the industrial mills did not have stones in because the rice passed through a destoner prior to going through the mill.

A study undertaken on behalf of WARDA⁹ into milling in Nigeria. After interviewing 200 consumers it found that the order in which consumers rated importance of factors in buying rice were as follows:

- cooking quality - notably expansion and speed of cooking
(the quicker the better)
- absence of stones
- taste
- colour
- percentage broken
- absence of mould
- aroma
- size of grain
- storability
- low price

⁹ O.T. Aderibgbē (1996)

6. SUMMARY AND CONCLUSION

The majority of rice is imported - approximately 200,000 tons as against 150,000 tons or so locally produced. This contrasts to the 1980s when imported rice accounted for less than half of rice consumed in Ghana. Under the more liberal trade regime, rice consumption is increasing by over 20% per annum, most of this increase being met by imports.

The effect of unrestricted imports is that the quality and price of imported rice now dictate the price for the locally produced rice. There has been an increasing trend for Ghanaian consumers to prefer better quality rice. Traders said it was no longer profitable to import 35% broken, as stocks did not move. The domestic rice is perceived to be of poorer quality.

The poor quality is due to a high number of broken grains, 25% + , stones and dust in the rice. Having said that though, not all local rice is of poor quality. Rice coming from the irrigated areas and processed in industrial mills is of acceptable quality and comparable to 10% broken imported rice. Some consumers think that rice sold from Kpong mills, near Accra, is imported rice.

Looking at the chain from production to retailer the following critical points are noted as where quality is lost.

| <u>Critical point</u> | <u>Quality issue</u> |
|------------------------|--|
| Planting: Seed Quality | Inconsistent seed leads to inconsistent rice quality |
| Delayed harvesting | High number of broken grains, also chance of immature volunteer seed admixture |
| Threshing on ground | Leads to stones and dust mixed with paddy |
| Parboiling | Methods employed in UWR and UER are superior to NR, producing a whiter rice. |
| Huller-type mills | Poor performance leads to grinding of broken grains to dust and so low out-turn and dusty appearance of rice |

The question that needs to be asked is: why does the system allow the poor quality rice to be produced and market? Is it more advantageous to produce and market low quality rice rather than high quality rice or are there "removable constraints" that can be identified that will enhance incomes, jointly or severely of growers, traders and processors?

Seed: in the irrigated areas the seed tends to be superior and is usually available on credit from the irrigation scheme management. For farmers in the inland valley the problem is one of a lack of seed availability, and if it were available, the lack of formal credit to purchase it.

Timely harvesting: This affects those most dependent on mechanisation. Improved and appropriate mechanisation for land preparation and harvesting to allow the crop to be harvested at correct maturity would be useful. The dispersed nature of production in the Inland valleys and northern regions though, would make the movement of large machinery expensive.

Threshing: Various machines have been tried out, but not taken up. Tarpaulins, to keep the grain off the earth, are expensive and therefore rarely used.

The price of paddy at the farm-gate is widely reported as being the same whatever the variety and whatever the condition. There does not appear to be any financial incentive on the part of the farmer to improve the condition of paddy from the field.

Parboiling: The traders who assemble the crop, and in the north parboil the paddy, could improve quality through better parboiling. The fact that parboiling is a cottage industry, carried out as an adjunct to other household chores, means that methods tend to be “regional” and not readily transmitted between regions.

Improved milling: The bigger mills do produce a better quality rice, but due to financial problems, they hardly operate outside the irrigated areas. In UER, the ICOUR mill was not operating during the December harvest season as it did not have parboiling facilities, and the parboilers traded their own rice in the local markets. Traders tend to prefer use the small mills, as they act as trading points, may provide storage facilities (as in Kumasi) and usually allow the traders to mill on credit, paying the milling charges after the rice has been sold. The large mills tend to buy paddy, and do not process for a fee, and so the traders potential margins are greatly reduced, making selling to the mill unattractive to the trader.

The small mills are mainly of the Engelburg huller-type. The out-turn is poor and the rice is dusty and contains stones. The quality from the newer Sataki mills is better, but the presence of stones reduces quality and costs the miller, as the stones rapidly wear the screens resulting in a need for their frequent replacement.

Price Differentials for local rice

Price differentials do operate between different quality rice. They were most pronounced in the UER and UWR and least pronounced in the NR.

Main Recommendations

Farmer-level

There is little incentive to use improved seed or improve harvesting and post-harvest practices on the farm when there is little or no premium paid for quality paddy. The paying of significant premium for quality will not occur until the processing of paddy is improved and the small mills are able to produce quality rice.

Processor Level

Firstly that existing larger mills operate on a service basis rather than buying rice and trading rice. This would help overcome some of their cash flow problems. In practice this would be very difficult to operate.

Secondly, that smaller Sataki mills be actively promoted, but that “a de-stoner” be incorporated into the system prior to milling to produce a stone-free rice. The improvement of mills would increase the out-turn of traders and the absence of stones would reduce the miller’s operator costs. A de-stoner needs to be identified or developed and the economics of its incorporation into small mills be investigated.

A small mill offering a higher out-turn and a cleaner and stone-free rice should be able to charge a higher milling fee and face lower maintenance costs. The reason it does not exist at present is that no such machine is available for the small scale mill.

Weights and Measures

Even given improved processing, there still remains the formidable problem that the weights and measures in the rice marketing system are “opaque”. There are no standard volumes and the traders may be making from 8% to 15% hidden profit by buying in bags and by using different measures for buying and selling. To transmit prices better, standard measures or weights should set-out and enforced.

Other possibilities

Improving parboiling techniques.

This could be as simple as taking UER and UWR technology to the NR to improve the basic level of NR paddy; or

Improving technologies being used, so that larger volumes can be processed improving quality and lowering costs. A lower cost of parboiling would lead to improved prices to farmers in north, who currently receive the lowest prices at the farm-gate.

The development of larger scale parboiling would lead to a transfer of wealth creation from women to men. Men tend to control rice production, so they would benefit from higher prices. Larger scale units for parboiling would mean fewer women in the business and the loss of direct income to them.

References

Asuming-Brempong S(1987)

Comparative Advantage and Rice Policy in Ghana
Masters of Science, Los Banos, University of Philippines

Asuming-Brempong S(?)

Rice Self-sufficiency in Ghana (paper from University of Ghana, Legon)
[argues that Ghana has no comparative advantage in rice production at present]

GLG-SOFRECO (Draft 1996)

"Bottom Land Rice Development Study (CFD-CREDIT): A detailed economic study of paddy production, processing & rice supplies & marketing in Ghana" Draft Main Report Nov. 1996

A.S. Langyintuo

DRAFT: Analysis of Rice Marketing in Northern Ghana. SARI March 1997

ODA (1996)

Renewable Natural Resources Profile: Ghana (1996)

Otoo E, Asubonteng KO, Apau AO, Senayah JK, Dedzoe CD, Mensah F

"Inland Valleys in Southern Ghana: Reconnaissance Characterisation" Report submitted to the Inland Valley Consortium: WARDA, Bouake, Cote d'Ivoire April 15th, 1996

Randolph TF & Toure AA (1995)

The Economics of Rice production in Niger: Background paper for the DAI Rice Sector Study, Draft 1995

Vordzorbge (1987)

quoted in Timmins (1991)

PPMED (1991)

Policy Planning, Monitoring and Evaluation Division, Ministry of Food and Agriculture (MoFA). Facts and Figures. MoFA

PPMED (1996)

Policy Planning, Monitoring and Evaluation Division, Ministry of Food and Agriculture (MoFA). Facts and Figures. MoFA

Timmins WH& Bickersteth JS, Clarke PA (1991)

Report on a Rice Processing Needs Assessment Study in West Africa: Visit to Cote d'Ivoire, Ghana, Nigeria and Sierra Leone. Nov. - Dec. 1991, NRI-ODA

A. Opuku-Apau, E Otoo (1996)

Rice Production in the Mankran Valley of the Ashanti Region of Ghana, Survey findings and implications for research, CRI, March 1991

A. Opuku-Apau, (1997)

DRAFT: Marketing of Rice in the Inland Valleys of Southern Ghana
CRI Feb.1997

O.T. Aderibgbe (1996)

An Economic Analysis of Rice Processing and Marketing in Osum and Ogun States; in Nigeria. PhD Thesis Obafemi Awolowo University, Ile-Ife, Osum State, Nigeria

Wayo Seini A. (1993)

Impact of trade liberalisation policies on Ghana's rice industry: A policy analysis matrix (PAM) approach. Paper presented at a seminar on Agricultural Sector Analysis: held in Akosombo, Ghana, Sept. 18 and 19 1993