

In the UWR, both men and women carry rice to the market for sale to any trader willing to buy. In some instances, however, farmers prefer to sell to their regular customers. Where possible traders intercept the produce on the way to the market and offer them prices sometimes lower than are ruling in the market. Farmers sometimes ignore the difference in prices and accept because by so doing they are relieved of the burden of carrying the grain and paying market tolls and council taxes. The average price paid farmers was ₦32,000 and ₦34,000/bag in UWR and NR respectively.

4.3 Processing activities of traders

In the NR, initial buyers concentrate the produce and release it into the market in bits after par-boiling and milling. May be because par-boiling has to be done, initial buyers were mainly females. Where males participated as in the UWR they had to sell to other traders for par-boiling. It was also observed that most of these assemblers lived in villages with rice mills or near them. In the UWR, traders travel from the urban centres to the hinterland to procure the grain back to the towns where the mills are installed for milling. Traders may buy in bowls or bags but store in bags. The quantity required for sale is par-boiled and milled.

On the eve of the marketing day, rice is put in a pot of water and boiled for a little while under fire made from firewood. This is collected and put in another pot and water added to submerge it overnight. As the grains absorb water and expand, more water is added to ensure that the grains are completely submerged. The next morning it is strained and dried. Drying takes place on a cemented floor where it is available or on any hard surface for up to two hours during which time the grains are stirred gently to allow maximum penetration of the sun rays.

The par-boiling procedure in the UWR is similar to that observed in the NR but a few differences were observed in the treatment of the grain. Unlike their counterparts in the NR, traders in the UWR attempt to sieve out all stones from the rice before par-boiling. Secondly, all empty glumes are removed by soaking the grain in water and removing them as they float on top. During drying, they first spread the grains thinly on a cemented floor and after an hour, heap it up slightly to avoid over drying. The length

of boiling and steaming may introduce some coloration in the grain. Grains are very white if boiling is at the minimum. Light yellowish coloration is obtained if allowed to boil for a little while on the first day and allowed to steam a little longer. The added advantage enjoyed by the traders in the UWR over those in the NR is that rice in the region is harvested at nearly physiological maturity and therefore less breakage in the grains. At the time of purchasing grain from farmers, traders peel off the seed coats to examine for broken grains. Rice with a high percentage broken grains are not purchased unless discounted at a rate between 5 - 20% depending on the level of breakage. This obviously is no incentive for farmers to harvest rice late.

The significance of par-boiling is ensure gelatinisation necessary for sticking broken grains so that they do not break up into pieces during milling especially in rain-fed rice not harvested at physiological maturity. It also improves the nutritional quality of the grains by fixing nutrients otherwise locked up in the seed coat into the grain.

4.4 Processing activities by rice mill operators

Rice produced by farmers is sold to traders who par-boil and mill before selling to consumers. No mills were observed in any of the farming villages surveyed but were located in villages within 20 km radius where rice traders were living. These were mainly the Engleberg type de-hullers, which are powered by diesel in the villages and electricity in the towns. There were about 26 serviceable mills in Tamale, and 10 in Wa. Milling out-turn is about 50% at the rate of about 450 kg paddy/hr. Additionally, Tamale is privileged to have three large scale Sataki type rice mills owned one each by Nasia Rice Company, Ghana Food Distribution Corporation and Juni Agro Limited. These have milling capacities of between 1 to 4 tons per hour. Due to limited quantities of rice handled by the traders, they tend to use the Engleberg type de-hullers.

The most disturbing components of the Engleberg type mills are the sieves which are easily damaged by stones and broken metals in the rice being milled. Rice milled in Tamale comes from surrounding villages such as Kumbungu, Dalun, Bontanga, etc. These mills are thought to do better than the ones in the villages in terms of quality of grains from mill. Traders have a system of credit with the millers

whereby milling charges are paid after the milled rice has been sold, usually to wholesalers who buy the grain at the milling place. This sometimes could still take up to five days before payment. In few instances some traders defaulted in payment.

Some rice varieties such as *Kpukpula* were said to pose problems of re-adjusting the shaft and reduced speed of milling due to its small size and hard seed coat. If rice is milled when not properly dried, a lot of power is drawn. Secondly the grain tends to be dusted with the dust from the mill thus making them unappealing to the eye. As rice is sold by volume, traders prefer to mill rice not properly dried because a larger volume is obtained and hence more money than when it is properly dried. Retailers of such rice however face the problem of moulding or discoloration of the grains if not sold in a relatively short period of time. On the other hand if rice is too dry or not properly dried, the grains tend to break during milling and thus blown away during winnowing.

Unlike in the northern region where the milled rice comes out with the chaff and has to be winnowed, in the UWR the grains are separated from the chaff and therefore requiring no winnowing.

Milling charges observed in both regions were variable, ranging from ₵800/bag to ₵1,600/bag with an average of ₵1,200/bag. Compared with the estimated operation cost of the mills as presented in Table 3, traders paid up to four times the nominal operation cost of roughly ₵400/bag of paddy rice.

Table 3. Cost of operating a rice mill in northern Ghana

Cost item (¢/month)	Amount (¢)	
	NR	UWR
Monthly depreciation on mill	40,000.00	40,000.00
Rent	3,000.00	6,000.00
Electricity	50,000.00	35,000.00
Materials for servicing	80,000.00	56,500.00
Labour for servicing	12,000.00	8,475.00
Labour to operate mill	100,000.00	100,000.00

Municipal charge	1,000.00	1,000.00
Bran disposal	16,000.00	15,000.00
Total operation cost	302,000.00	251,975.00
Mill turn-over (bags paddy)/month	750.00	600.00
Cost (¢/bag)	402.66	420.00

Source: Field survey, 1996

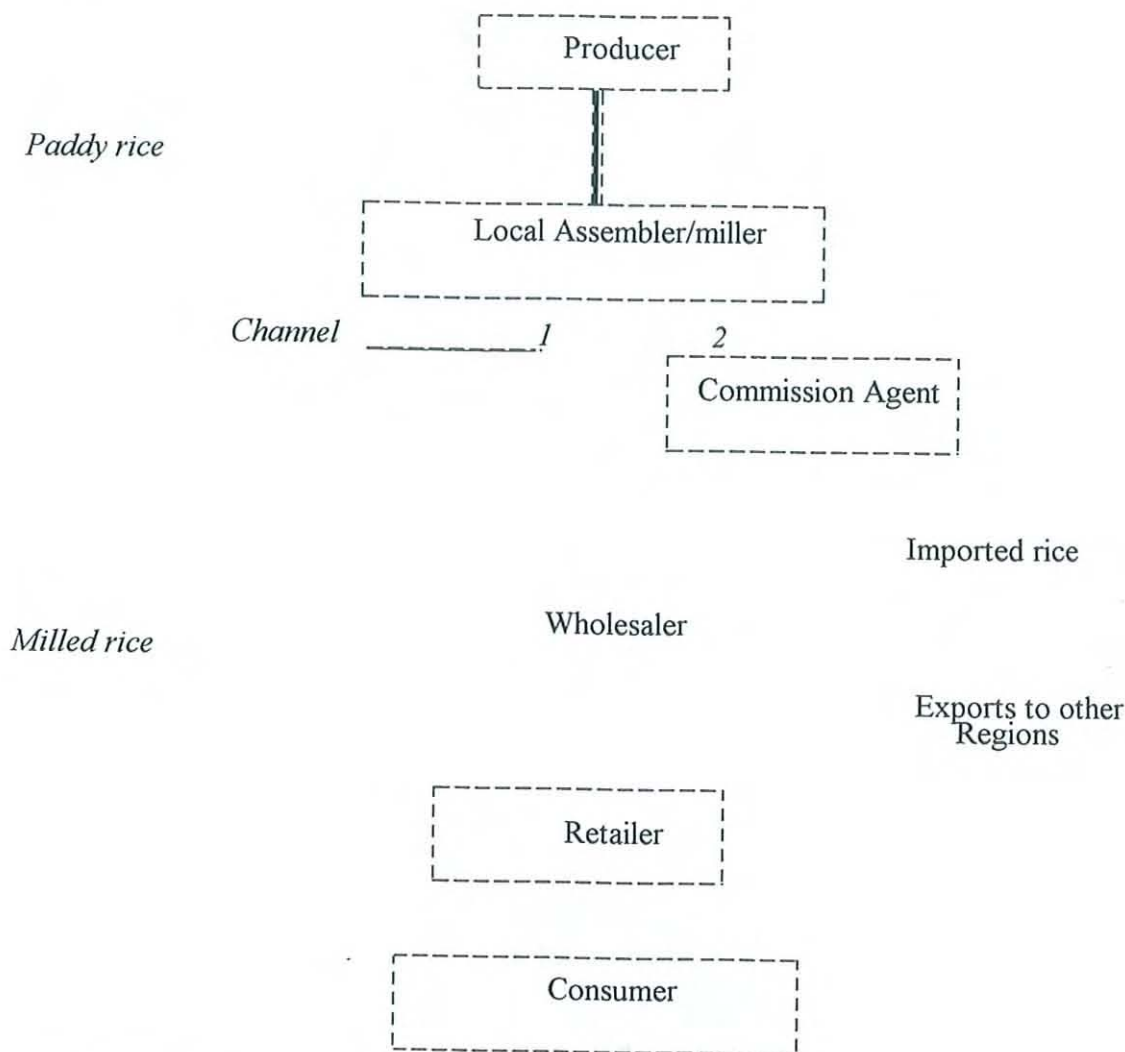
4.5 Rice marketing activities at the trader level

After milling traders either sell to wholesalers directly or through commission agents depending on whether rice is sold in the village or urban market. In NR if the local assembler sells in the village market she sells directly to the wholesaler. On the other hand if she transports the milled grain to Tamale, she hands it over to a commission agent who sells it for a commission of ¢100/bag. Commission agents are traders who have storage facilities but no money to purchase the grain. They therefore depend on other traders to provide the grain and they are responsible for providing storage and identifying potential buyers. Because they act on a commission based on quantity of grain sold, they tend to be more aggressive in attracting buyers than usually the case with the traditional assemblers or wholesalers. All the risks in the transactions are, however, borne by the assembler.

Where sale is direct to wholesaler, the units of measurement used are bowls (2.5 kg) and bags (100 kg). Because wholesalers are sometimes compelled to pay initial assemblers same price, as they would sell to retailers, they prefer to measure the grain in bowls. In the process they are able to measure out varied quantities of the grain ranging from 2.6 kg to 3.1 kg with an average of 2.8 kg instead of the standard 2.5 kg.

Two marketing channels were identified as presented in the simplified diagram below (Figure 4). Channel 1, which traces rice from producer to local assembler, to wholesaler, retailer and consumer was observed to be the most prominent.

Figure 4. Rice marketing channels in northern Ghana



Source: Field survey, 1996

Note: Local Rice - - - - - Imported Rice

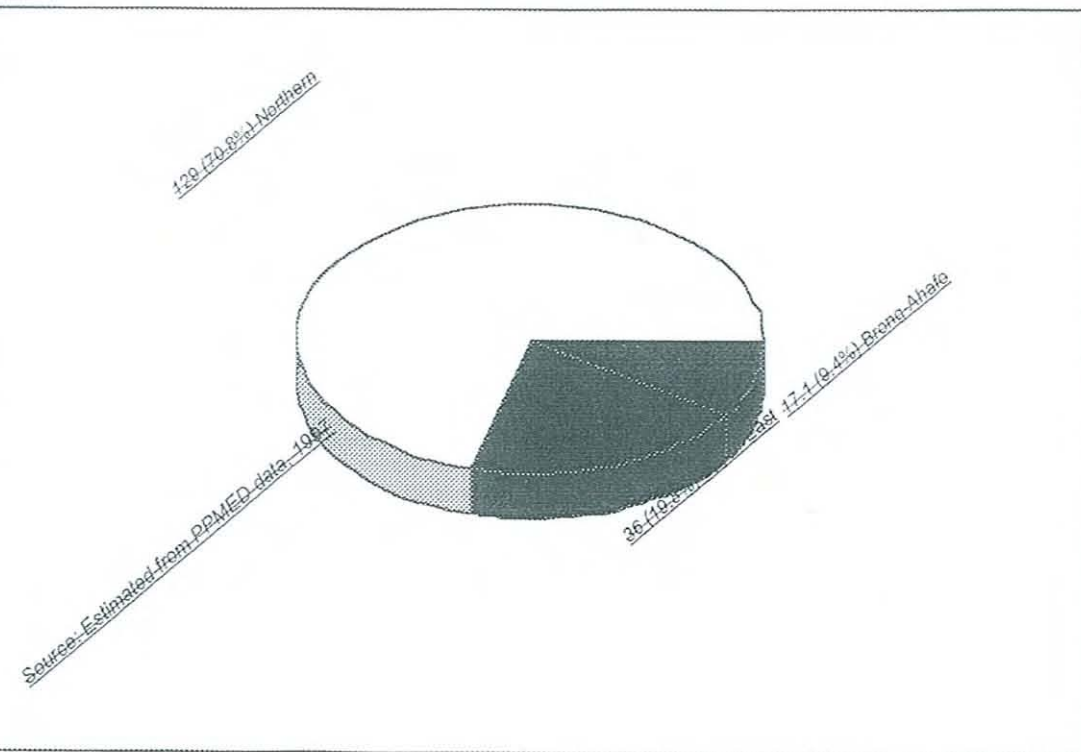
Channel 2 identifies a commission agent as the intermediary between the local assembler and the wholesaler. This is important only in the Tamale urban market in the NR. In the UWR, wholesalers buy the grain from farmers, sell to retailers after milling who intend sell directly to consumers. In both regions wholesale traders may also sell directly to consumers.

Besides local rice, traders handle imported rice at the ratio of 4 : 1 (local : imported). The reason being that imported rice is preferred by the elite and in fact unaffordable by all other people. Consumers also thought that local rice mixed better with beans, a popular dish. Besides, they thought local rice was

more filling and did not give the sickness called beriberi if consumed in large quantities, as does imported rice.

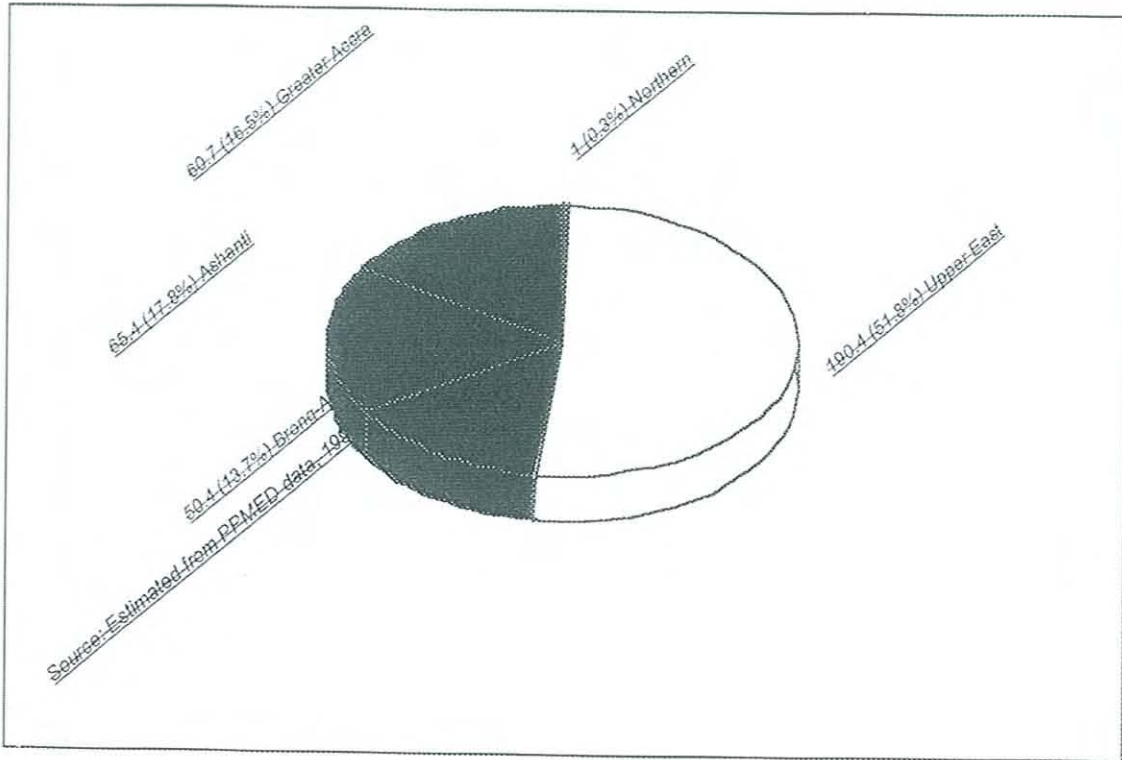
4.6 Movement of rice in northern Ghana

The dynamism of inter- and intra-regional maize movement in northern Ghana is more pronounced in the UER than in the other two northern regions. Between August 1995 and July 1996, about 182 MT of locally produced rice was marketed in Tamale and seven other markets in NR. Of this quantity 71% was sold within the region, 20% to UER and the remaining 9% to the BAR (Figure 5).



During the same

period, about 368 MT was marketed in five markets in the UER. Over 50% was sold within the region, less than 1% to NR and the rest transported to southern Ghana (Figure 6). In the UWR, 80% of the 72 MT marketed was within the region and the remaining 20% sent to Techiman in the BAR.



In 1996, about 558 MT of local rice was marketed in Techiman from where it was either sent to Accra, Obuasi, Mankessim or Kumasi. The bulk of this quantity was from Bolgatanga and Wa. It was indicated by traders in Techiman that rice from NR was less preferred to that from either UWR, UER or within BAR due to its poor quality resulting from presence of foreign matter, discoloration, mixed grain sizes and grains turning mouldy within a short period in storage.

Transportation of rice involves some costs. An estimate of the relationship between transport cost, distance and quantity transported indicated a positive relationship with distance and a negative (although not significant) one with quantity (Table 4). Charges are higher during the rainy season than in the dry season due to poor road networks.

Table 4. Estimate of the relationship between transport cost, quantity of rice and distance.

Variable	Coefficient	t-ratio
Constant	393.24	0.389
Seasonal dummy	500.61*	2.689

Distance transported	7.57**	18.968
Quantity of rice transported	-0.74	-0.123
R ²	0.82	

Adjusted R² 0.80

Dependent variable: Cost per bag of rice transported

Source: Field survey, 1997

Note: * Significant at 5% error level
 ** Significant at 1% error level

5. Marketing margins

In the UWR the initial buyers process and sell the grain to retailers or direct to consumers. They are therefore selective in their choices of grain to purchase and endeavour to dry par-boiled rice on cemented floors. Consequently rice from the UWR tends to be of better quality and hence attract a higher premium than that from the NR where sometimes it is dried on ordinarily hardened floor so that during collection some stones are added. Secondly, while locally milled rice from the NR goes mouldy in storage that from the UWR remains clean for as long as it is stored. In the NR, initial assemblers may sell to wholesalers directly if marketed in the village or through commission agents if in the Tamale urban market. Where commission agents are used as intermediaries, they are paid ₵100/ bag sold.

Local rice enjoys differential pricing depending on the variety and quality of milling. In NR, the price of a bowl of local rice ranges from ₵1,400 - ₵1,500 for *Kpukpula*, ₵1,500 - ₵1,600 for *Anyufula*, ₵1,600 - ₵1,800 for *Mandi*, *Afeke*, and *Bontanga* with mean price of ₵1,600. In the UWR, a bowl of *Muikpong* costs ₵2,600 - ₵2,800 and *Muibile* ₵2,400 - ₵2,500 with an average price of ₵2,600. In contrast, imported rice costs ₵4,000/bowl on the average in both Wa and Tamale.

Analysis of the costs and returns to rice traders appears more complicated than for other commodities. An assembler buys paddy rice and transforms it into milled rice at a conversion rate of one bag paddy to half bag milled rice. An examination of the operations of an assembler in NR indicates that a margin of -

¢2,000 is attributable to his effort in changing the form from a bag of paddy to half a bag of milled rice in addition to her marketing costs (Table 5). Wholesalers tend to exploit assemblers by weighing out 2.8 kg of grain as a bowl full at ¢1,600.

Table 5. Costs and returns in local rice trade in northern Ghana (¢/bag)

Variable	NR	UWR
Farm gate price (80 kg paddy rice)	34,000.00	32,000.00
Transport cost from farm village to store ¹	500.00	1,100.00
Cost of processing ²	4,500.00	3,360.00
Transport cost from mill to market	1000.00	500.00
Marketing costs	350.00	400.00
Nominal selling price of rice by assembler	64,000.00	100,000.00
Margin to assembler (for 1 bag of paddy rice) ³	-2,000.00	18,000.00
Effective selling price of rice by assembler ⁴	57,142.85	89,285.70
Transport and storage costs ¹	440.00	200.00
Price at the retail level	66,000.00	104,000.00
Effective margin to wholesaler ⁵	8,857.15	14,714.30
Transport and marketing costs	300.00	300.00
Consumer price	68,000.00	108,000.00
Margin to the retailer	2,000.00	4,000.00
Value of milled rice from 1 bag paddy at retail level ³	34,000.00	54,000.00
Marketing margin from a unit (1 bag) of paddy rice	0	22,000

Source: Field survey, 1996

Notes:

Includes loading and off-loading charges - over a 30 km radius.

Includes cost of transportation to mill, milling and winnowing charges.

Conversion factor from paddy to milled rice is 50%

Wholesalers measure out 40 bowls (each of 2.8 kg on average) as a bag full (112 kg).

Wholesalers reduce the weight of the bag at assembler level from 112 kg to 100 kg.

Re-bagging their purchases gives them up to 12% more grain thus implying that the effective cost of a bag of milled rice at the wholesale level is actually ₡57,142.85 thus giving them ₡8,857.15 margin when they sell to retailers at ₡66,000/bag. Retailers on their part gain a margin of ₡2,000 after selling to consumers.

The situation in the UWR appears more promising for traders. Improving the quality of the grain earns assemblers up to ₡18,000 a bag with about ₡12,640 as their profit margin (Table 5). Although wholesalers equally exploit assemblers, their margin of ₡14,714.30 is less than that obtained by the assemblers. However their profit margin of ₡14,514.30 is certainly higher than that obtained by the latter. Retailers on their part earn ₡4,000/bag.

Traders transporting local rice from Wa and Tamale to sell in Techiman make positive returns of about 33% and 13% over and above what they earn in Wa and Tamale respectively (Table 6).

Table 6. Nominal and effective margins of local rice trade in Techiman (₡/bag)

Variable	Tamale	Wa
1 Nominal purchase price of milled rice	64,000.00	100,000.00
2 Effective purchase price	57,142.85	89,285.70
3 Total transaction costs	5,350.00	3,350.00
-transport charge (including loading/off-loading)	4,550.00	2,550.00
- use of shed in the market	100.00	100.00
- market toll/commission	700.00	700.00
4 Selling price	72,000.00	112,000.00
5 Nominal margin (4 – 1)	8,000.00	12,000.00
6 Effective margin (4 – 2)	14,857.15	22,714.30
7 Effective profit margin (6 – 3)	9,507.15	19,364.30

Source: Field study, 1997

6. Conclusion

The analysis demonstrates clearly that improving upon the quality of rice attracts a premium which consumers are prepared to pay for. Where this is not effected, the initial assemblers are the victims of poor returns. What needs to be established is the response of different varieties to different heat treatments during par-boiling. If these varieties require differential treatments, it means therefore that traders in NR may still content themselves with the difficulty of achieving good quality rice grains given the ad-mixtures observed on farmers' fields. This would imply a concerted effort on both farmers and traders to achieve grain purity and harvesting it at physiological maturity. The use of drying patios may also be of benefit to all. It also points to the fact that if farmers continue to produce at this rate it may be difficult for them to join the crusade to improve upon grain purity since traders may still compete for the little that is produced regardless of its purity.

7. References

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