



## Profitability and Efficiency Analyses of Small Scale Rice processing units in Ngoketunjia Division, North West Region, Cameroon.

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### ABSTRACT

Rice production and processing over the years has been on an increase with more small holders entering the business. This study on profitability of processing and marketing of small scale rice processors had as objective to analyse the profitability levels of rice processing and marketing by small scale processors, determine the value added to the commodity at each stage and also identify the constraints faced by these processors. The study used primary data collected using well-structured questionnaire from millers only, miller traders for white/parboiled rice through a multistage sampling technique. Results showed that the net processing income (3,151,201), value added (8,147,456) and efficiency (138) for miller-traders of white rice was highest, followed by miller-traders for parboiled rice and lastly millers only. Results further showed that millers only had Benefit/cost ratio of 0.4 indicating that milling only is not profitable due to small quantities milled, and high fixed cost. Miller-traders for parboiled rice had a benefit/cost ratio of 2.3 implying that their venture is most profitable. Based on the results, it was recommended that millers only should purchase large quantities of paddy to enable them reduce the overhead cost. Also the services of parboilers should reflect in the sales price of parboiled rice so that the parboiling services can be paid for.

**Keywords:** Profitability; efficiency; rice; marketing; Ngoketunjia

### Academic Discipline And Sub-Disciplines

Agricultural Economics. Agribusiness Management

### SUBJECT CLASSIFICATION

Profitability and Efficiency Classification

### TYPE (METHOD/APPROACH)

Historical, Survey, Interviews and Questionnaire

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Rice has been gathered, consumed and cultivated by women and men for more than 10,000 years, longer than any other crop (Kenmore, 2003). According to Tsuboi (2005), the total area under rice cultivation is globally estimated to be 15,000,000 hectares with annual production averaging 500,000,000 metric tons. Also, according to the FAO Rice Market Monitor (2011), the global outlook for 2010 production has improved with a forecast undergoing a 3 million upwards revision to 700.7 million tons. Rice production activities provide employment for several hundred millions of people who work directly in rice production or related support. According to UNCTAD (2011), market information reveals that as at 2004 world rice consumption has increased by 40% in the last 30 years from 61.5Kg per capita to about 85.6Kg per capita. However, rice production has increased at a lower rate than population growth. This has been due to poor harvest largely associated with poor soil and adverse weather conditions, incidents of pests and diseases, labour shortages especially with the current scourge of HIV/AIDS and other chronic diseases. Thus, poor rice harvest can have adverse effects on many nation's economies. (DAT, 2009).

Currently, rice is grown in more than 75% of African countries with about 800 million people involved in the production. It is the most staple food for the population in Cape Verde, Comoros, Egypt, Nigeria, Tanzania and Cameroon. (Odogola, 2006). The Africa continent is the home of *Oryza glaberrima* where it has been domesticated for more than 3500 years and is mostly confined to West Africa where it has been mostly cultivated. Over the years, *Oryza glaberrima* has been crossed with another breed *Oryza sativa*, giving rise to a progeny NERICA, (New Rice for Africa). NERICA is characterized by higher yields, early maturity, rich in protein and highly disease resistant (WARDA, 2004). Rice cultivation in Cameroon dates back to the industrial era. According to Goufo (2008), rice production is mostly in the hands of small holder sector which produces over 93% of total outputs. MINADER report (2009) states that most of the production comes from irrigated schemes in the North West and Far North Regions of Cameroon. Over the years, the Cameroonian government has launched various programs aimed at increasing earnings for farm agro holdings. Nevertheless, small scale transformation units do not benefit from these programs despite their contributions to boost the economy. After harvest, activities shift to post production operations such as threshing, drying, cleaning, milling, storage, product processing and marketing which provide employment for millions of people (Odogola, 2006). In most rice producing countries, up to one quarter of harvested rice is lost due to insufficient post harvest operations. Post harvest processes help preserve food, reduce losses and to an extent increase the availability of food products over a longer period. Thus, the promotion and improvement of food processing and preservation at all levels of production should be an essential component of national strategic plans for food security (Andah, 2000).

In most developing countries, there exists considerable interest in the establishment of small scale food processing facilities. However, these facilities are bound to face competition from "Western technology". The Cameroon government has over the years tried to encourage the establishment of small processing facilities to encourage market liberalization. According to Spooner and Smith (1991), the main objectives of liberalization are to increase economic efficiency of marketing and price structures and to give incentives to profit maximizing entrepreneurs to develop new products, new methods of product exploitation, and sources of supply and organize the markets. To ensure that private entrepreneurs engage in new markets, the Cameroon government has promulgated certain laws to enable the creation of cooperatives and common initiative groups with specific functions of marketing the products of their members. Processing and marketing is carried out by factory and business middlemen. Private individuals process rice using small husky machines which generally retain one out of every 10 bags of paddy (MINADER, 2009). In Njoketunjia Division in particular, there are a few rice processing mills which provide employment and contribute to the development of the region. Little or no support has been given to these small scale processors who do not even participate in making policies related to processing and marketing. Their needs and priorities are not included in the system and have no link with researchers over the last decades. The volume of rice milled by these small scale processors is determined by the operating conditions of the parastatals (within their localities), other biophysical factors (distance from farms to mills, road infrastructure, types of mills). This has been reflected in continuous reduction in rice quantity. Nevertheless, appropriate and efficient marketing is the stimulant of large scale production (Pabeo and Ignacio, 1987). This study therefore intends to analyze the efficiency and profitability of small scale rice processors as well as identify the constraints and opportunities in small scale processing. This study is justified because the results will be used to inform decision making bodies on rice production, processing and marketing in Ngoketunjia Division and Cameroon at large.

## METHODOLOGY

The study was conducted in Ngoketunjia Division, which is one of the seven Divisions that make up the North West Region of Cameroon. The division is made up of low lying plains with some undulations. Temperature here ranges from 20°C- 35°C and average rainfall of above 2000mls. The soil type is mostly sandy, loam, clay and alluvial deposits. Numerous streams flow from the hillsides and this increases the water table resulting in many swampy areas, thus favouring the production of swamp rice.

The whole population of small scale processors was considered since they were below 100 in number. The population censused was from all the 3 sub divisions growing rice. All the millers-only and the miller-traders totally 50 were considered for the study. The principal methods used to collect primary data were a combination of questionnaires, focus group discussions, interviews and direct observations. Data covering socio-economic characteristics, rice processing and milling operations were elicited from the respondents. Data collected were analyzed through the use of descriptive statistical tools as well as profit analysis.



Model specification: the study made use of the following.

- a) Net Processing Income

$$NPI = GPI - TC \dots\dots\dots (1)$$

Where, NPI = Net Processing Income

GPI = Gross Processing Income

TC = Total Cost

- b)  $BRC = \frac{\sum R_1 / (1+i)^n}{\sum C_1 / (1+i)^n} \dots\dots\dots (2)$

Where BCR = Benefit Cost Ratio

R<sub>1</sub> = Annual Net Cash Flow (CFA)

C<sub>1</sub> = Discounted Cost of Investment (CFA)

i = Interest Rate (CFA) processing or marketing

n = Years of useful life of different categories of processing or marketing

Value added

$$VA = C_{PT} - C_{PU} \dots\dots\dots (3)$$

Where VA = Value Added

C<sub>PT</sub> = Cost of purchasing transformed paddy (CFA)

C<sub>TU</sub> = Cost of paddy in its transformed form (CFA)

$$\text{Processing Efficiency} = \frac{\text{value Added by processing}}{\text{Cost of processing services}} \times 100 \dots\dots\dots (4)$$

$$\text{Marketing Efficiency} = \frac{\text{Value Added by Marketing}}{\text{cost of marketing services}} \times 100 \dots\dots\dots (5)$$

## RESULTS AND DISCUSSIONS

### Socio-Economic Characteristics

The socio-economic characteristics of the respondents are summarized in table 1. Results showed that majority of the processors (42%) fall within the age group of 31- 40 years of age. This explains that middle aged people are more involved in rice processing since it requires strength. Table 1 also shows that most of the respondents (58%) have at least a primary school education while 12% had at least a university education. Also, 80% of the respondents were married as compared to 20% who are single. This indicates that married people are more pruned to process and sell their products so as to meet up with family needs. It could also be seen from results that 64% of the respondents had been engaged in rice processing for at least 5 years while 44% had a mill size of 151- 300Kg/hr milling capacity. It was observed that there are generally 3 types of mills in the area which are grouped into four groups based on the number of Kilograms of paddy that can be milled per hour. These results are in line with the results of Lancon *et al* (2003) which reveal that milling capacity varies from 50Kg per hour for the smallest up to 500Kg for the largest mills. Table 1 further shows that only 26% of the respondents obtained credit for their business. The level of access to credit by small scale processors definitely affects their profit and efficiency either negatively or positively. Also, 46% obtained credit from informal financial institutions indicating the availability of local lending institutions such as “*tontines, Njangis*”, etc within the division. Table 1 further reveals that the net average income per respondent from 2007 to 2012 ranged from < -5,000,000 to > 40,000,000 FCFA. It is worth noting that above 50% of the small scale processors had a negative income which can be explained by the small quantities of paddy processed (millers only), purchased, processed and sold by miller-traders, low quality that is not competitive to imported rice and the fact that some processors enter the business while others exit. Nevertheless, over the six year period, the deficit is offset by the remaining respondents who mostly miller- traders had an average net processing income of 2,413,958 FCFA. The quantity of rice processed contributes to the level of profits. The higher the quantity processed, the lower the overhead cost thus higher profits and vice versa. From available data (2007-2012), an average of 796 bags (100kg = 1bag) of paddy rice was milled at an average fee of 700 FCFA leading to an average income of 557,200 FCFA per year. This low income can be explained by the low quantities of paddy milled given that they do not purchase paddy rice.



Table 1: socio-economic characteristics of respondents

variable	frequency	Percentage (%)
<b>Age (years)</b>		
20-30	17	14
31-40	21	42
41-50	14	28
51-60	6	12
61 and above	2	4
<b>Educational level</b>		
No formal education	-	-
Primary school	29	58
Secondary school	15	30
Tertiary education	6	12
<b>Marital status</b>		
Single	10	20
Married	40	80
<b>Experience (years)</b>		
0-5	32	64
6-10	14	28
11-15	4	8
<b>Mill sizes (kg/hr)</b>		
0-150	3	6
151-300	22	44
301-500	7	14
501-1000	18	36
<b>Access to credit</b>		
Yes	13	26
no	37	74
<b>Net average income (FCFA)</b>		
<-5,000,000	28	56
-5,000,000-5,000,000	11	22
5,000,001-20,000,000	7	14
20,000,001-40,000,000	3	6
>40,000,000	1	2
<b>Total</b>	<b>50</b>	<b>100</b>

Also the average quantity purchased and processed by miller-traders dropped from 3087 to 996 bags over the study period. This is due to the fact that within the period, they did not face much competition from the government institution which started restructuring in 2010 leading to stiff competition with the smaller miller-traders. Over the six year period an average of 2000bags were purchased at an average price of 11,700 FCFA per bag.

Table 2 reveals that the net yearly parboiling income per respondent per year for par boilers was 3,052,215 FCFA with a value added of 1,222,184 FCFA and efficiency of 138. The net yearly milling income of millers only was 253,180FCFA per respondent, the value added was 4,089,818 FCFA and an efficiency of 308. The net yearly milling income of miller-traders of white rice was per respondent was 3,151,701FCFA with a value added of 8,147,456 FCFA with an efficiency of 138.



Par boilers had a higher net profit to sales of 10,719,931FCFA compared to miller trader of white rice which can be explained by the increased quantity of par boiled rice of 76Kg per 100Kg compared to 65Kg per 100Kg of white rice. The average price of parboiled and white rice is almost the same at 12,500FCFA.

Further analysis showed that millers-only had a Benefit-Cost Ratio less than 1 indicating low (BRC) compared to the miller-traders and par boilers who had their BRC equal to 1.52 and 2.3 respectively. These ratios indicate high profitability. These results are in line with those of Inuwa *et al* (2011) which revealed the BRC of both millers and par boilers to be greater than 1. These ratios are based on a discount rate of 4.25M and the interest rate on loans of 16% being an average of 14% for commercial banks and 18% for micro-finance institutions.

**Table 2: profitability, value added and efficiency**

category	Millers-only	Miller-traders (white rice)	Miller-traders (parboiled rice)
Net processing income (FCFA)	253,180	3,151,701	3,052,215
Value added (FCFA)	4,089,818	8,147,456	1,222,184
Efficiency (processing)	308	138	138
Efficiency (marketing)	-	132	132
Net profit to sales	143,336	3,979,753	10,719,931
Benefit/cost ratio	0.4	3.8	2.3
Quantity (tons) Paddy	3	6	9
Quantity (tons) Milled	1.9	3.8	6.6

Source: field data

## Constraints and Opportunities in Small Scale Processing

There are constraints in paddy processing such as low level of paddy supply due to low production, poor quality of rice, price fluctuations and seasonality. Also, there is a low level of operation capital due to low income and poor access to credits. Small processors in Ngoketunjia experience similar constraints in the area of technical performance of rice mills, access to repair facilities and services, quantity and quality of paddy from farmers and marketing, quality of milled rice, broken rice and bran. Record keeping is completely absent either because processors found it too difficult, did not know the importance and some deliberately refused to avoid the payment of taxes to government. Government institutions in addition to the high taxes conduct illegal collections from them, which has a negative impact on their business. Also, rice miller-traders reported that rice with a lot of broken grains is a challenge to market due to its poor demand. Millers also reported unstable prices especially during harvest. They further cited inadequate options for packaging milled rice. Also, the activities of UNVDA which is a large scale processor operating in Ngoketunjia Division, and their activities affect those of the small scale processors.

## CONCLUSION

The study was conducted with the aim of analyzing the profitability and marketing efficiency of small scale processors in Ngoketunjia Division. The study analyzed the socio-economic characteristics of small scale processors as well as identified the constraints encountered in the processing and marketing of rice. Small scale rice processing and marketing is carried out by millers-only and miller-traders with an average daily capacity of 3.7tons of paddy rice. Findings show that small scale processors in Ngoketunjia Division have great potentials for rice processing and marketing despite the constraints they face especially having to compete with UNVDA. Based on these, it is therefore recommended that:

- Small scale rice processors should be included in the policy decisions of the rice sub sector and not only large scale processors like UNVDA.
- Small scale rice processors should form associations or cooperatives which will enable them benefit from government assistance or act as a lobby group for them to be considered in policy making.
- Sensitize millers and miller-traders to invest on bulk paddy procurement and transportation for all year-round milling. This will reduce transportation costs and high costs of milled rice.



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