Full Length Research Paper

Competitiveness of rice processing and marketing in Ebonyi State: A policy analysis approach

Mkpuma Ude, Iyabo Bosede Adeoye, Sulaiman Adesina Yusuf, Olubunmi Lawrence Balogun* and Roseline jumoke Akinlade

Department of Agricultural Economics, University of Ibadan, Oyo State, Nigeria.

Past government inconsistent policies were not successful in securing good market shares for domestic rice processors and marketers hence they suffered great losses. The study was therefore carried out to assess the competitiveness and impact of policies on domestic rice in Ebonyi State, Nigeria. A multi-stage sampling technique was used to select 60 processors and 60 marketers from the study area. Primary data were collected with structured questionnaire and analysed using policy analysis matrix. Results revealed that private profit was positive (₦99, 063.11) for processors and negative for marketers (₦9, 563.33) while social profit was negative (₦4, 838.3) for processors and positive for marketers (₦8, 473.22) for the output of a hectare of land. Nominal protection coefficient for output and input were 1.52 and 0.92 respectively for processors, 1.5 and 1.4 for marketers. Domestic resource cost coefficient was 1.41 and 0.53 respectively for processors and marketers. The EPC values of 10.33 and 0.17 respectively for processors and marketers showed that rice processors were protected while marketers were not protected in the area. The study recommends that the protection policy should be intensified since findings have shown that the enterprises were profitable.

Key words: Rice, processing, marketing, Ebonyi State.

INTRODUCTION

Rice (*Oryza spp*) is a cereal crop of outstanding economic importance, grown for human consumption and it is a major staple food in West Africa (Atungwu, 2005). It plays a very significant role in the food security, poverty alleviation and human development chains (Amaza and Maurice, 2006). Rice is a major source of livelihood for smallholder farmers, processors and traders and is a major food for urban and rural dwellers in West and Central Africa where the demand is growing at the rate of 6% per annum-faster than anywhere else in the world (Kormawa and Toure, 2005). It is perhaps the world's most important food crop being the staple food for over 80% of the world's population particularly in India, China, and a number of other countries in Africa, and Asia (Okoruwa, 2006). Of all the food items, rice is the most widely consumed in Nigeria (Joseph, 2007). The crop is commonly consumed even as a food crop for household food security. The average Nigerian consumes 24.8 kg of

rice per year, representing 9% of annual calorie intake, (Bamidele et al., 2010). About 3 billion people eat rice everyday with Nigerians consuming 4.5 million metric tons (This Day, 2009). Though per capita consumption in Nigeria has increased, it still lags behind compared to the rest of West African sub region at 34 kg per capita (Olaf et al., 2003). Rice processing is the transformation stages that harvested rice passes through before it comes to the point where it is fit for consumption (Mkpuma, 2007). In Nigeria, processed/milled rice in 2008 was approximately 2 million metric tons including the estimated 800,000 metric ton that was suspected to have entered the country illegally on annual basis (USAID, 2009). Rice processing and marketing are dictated by economic forces beyond the mere confines of the farmer (USAID, 2008). The small rice mills are the most predominant mills. Estimates of Presidential Rice Initiative, (2002) indicates that there are about 3,500 small/medium scale mills scattered all over Nigeria but most are concentrated in Nassarawa State, Ebonyi State (Abakaliki) and Niger State. This represents about 25% of small mills in Nigeria(Akpokodje et al., 2001).

---

*Corresponding author. E-mail: blarrybunmi@yahoo.com.

The oil boom of the 1970s brought with it an insatiable appetite of Nigerians for imported goods (Ogundele, 2003). Rice industry is about 70% import based despite the country's potential to produce the commodity to meet domestic demand and even export surplus. Recent rice importation figures attest to the fact that rice is in high demand in Nigeria. With regards to rice value chains, although some policies aimed at producing the value added rice domestically have stimulated investment in upgrading rice processing facilities, a host of other government policies and institutional arrangements have prevented the rice value chain from developing into a productive and dynamic industry (USAID, 2005). For instance, in 2005 the Federal Government of Nigeria encouraged the investment of large multinational rice companies (for example, Stallion Group) in rice processing in Nigeria by granting them licenses to import brown rice at a preferential tariff rate of 50% licensed holders were expected to invest in rice processing and cultivation schemes in return for exclusive license to import brown rice for polishing. Surprisingly, the FGN abandoned the exclusive licensing scheme 1 to 2 years after its introduction. The limited impacts from these policy inconsistencies show the importance of consistent policy as well as addressing the constraints at each level of the value chain, not just processing but also in marketing. Increasing the market share of domestically produced rice will expand the depth and breadthof outreach and production to small farmers especially in the area. It will increase the overall availability of rice in the country, making the country less sensitive to international price fluctuations and improve the accessibility of rice to urban consumers (lower price). Replacing imports with domestic processing and marketing (import substitution) will save the state and country in general the much needed foreign exchange. It was in view of the foregoing that this study examined the details of costs involved in each of the selected stages of the value chains in rice processing and marketing which will serve as a useful tool to both local and foreign nationals which may be intending to embark on the enterprise. Abakaliki was chosen purposively as the area of this study in view of its strategic position in the state especially when it comes to rice processing and marketing.

According to Nordin et al. (2008) the theory of competitiveness is based on comparative and competitive advantage, both of which are related, but one is often mistaken for the other. Competitiveness in rice processing and marketing is a comparative concept of the ability and performance of a firm, sub sector or country to sell and supply the commodity in a given market. It indicates whether a firm could successfully compete in the trade of the commodity in the international market, given existing policies and economic structure (ERDD, 2011). Comparative advantage refers to the ability of one nation to produce a commodity at a lower opportunity cost of other products forgone than another nation. The study adopted the policy analysis matrix methodology in determining the competitiveness and comparative advantage and to measure the effect of policies on rice processing and marketing in the study after which the results were subjected to sensitivity analysis to test systematically what happens to the earning capacity of the commodity system if events differ from the estimates made about them in planning.

MATERIALS AND METHODS

Study area

This study was carried out in Ebonyi State. It has a total of thirteen Local Government Areas (NPC, 2006). The State has a common boundary with Abia State and Cross River State to East respectively and Enugu State to the West. It also has a common boundary with Benue State to the North. The state has a total population of 2,176,947 which is made up of 1,064,156 males and 1,112,791 females (FGNOG, 2009). Abakaliki is one of the Local Government Areas (LGA) in Ebonyi State and it is also the state capital territory. It is located on the Northern part of the state and has a total population of 149,683. Abakaliki Local Government was selected due to its active involvement in rice enterprise and thus one of the major rice producing, processing and marketing areas in the state; it has the largest rice milling industry in the State, (UNIDO, 2008).

Data and modeling assumptions

A random sampling technique was used to select 120 respondents which comprised 60 processors and 60 marketers. Primary and secondary data were utilized for this research. The primary data were collected on: fixed and variable assets like parboiling drums, baskets, mats, labour costs, volume of trade, marketing costs, selling prices, incomes and socio economic status of the processors and marketers involved in the enterprises. The primary data were collected using pretested questionnaire. Secondary information was also collected on international prices of input, exchange rates. These were collected from the World Rice Statistics, Central Bank of Nigeria, conference proceeding and National Bureau of Statisticsamong others. The social prices were computed by adjusting the free on board (FOB) for insurance cost (1%) and freight to arrive at the x cost, insurance and freight (FOB). This was done by summing up the freight charges, tariff, port charges,and transportation cost and import duty to arrive at the CIF price. The CIF Lagos price was converted to Nigerian local currency (naira) at the exchange rate of ₦153.00 to one US dollar (world reference currency) which was ruling at the time of result computation. The social price

Table 1. Framework of policy analysis matrix.

	Revenue	Tradable inputs	Domestic factors	Profits
Values at private prices	$A = P_{id}^*$	$B = P_{jd}^* Q_j$	$C = P_{nd}^* Q_n$	D
Values at social prices	$E = P_{ib}^*$	$F = P_{ij}^* Q_j$	$G = P_{ns}^* Q_n$	H
Divergences	I	J	K	L

Source: Waqar et al. (2005).

of land was taken at rental price as used in Chinnappa et al. (2007). The social price of labour was calculated by dividing labour into peak season and off season components as used by Yao (1993) cited in Ogbe et al. (2011). The wage rate in the peak season was the opportunity cost of labour for the period being examined. The social price of gas (petrol) was taken at 2% subsidy. The opportunity cost of labour in the off-season was 50% in the ruling wage rate. The social price of labour was computed by:

$$Pl = \frac{Wp - 0.5Wo}{2}$$

Where:

Pl = Social price of labour; W_p = prevailing wage rate in peak season;
W_o = prevailing wage rate in off peak season

For rice processing, 1.527 tonne of paddy is required to produce 1 tonne of milled rice. The input-output ratio is 1 to 0.65, which is also the conversion factor from paddy to milled rice (Oguntade, 2011). Meanwhile, the results were subjected to sensitivity analysis to assess the extent of the PAMs' indicators. The output (yield) and exchange rates were increased by 10% and reduced by the same proportion.

Analytical technique

Policy analysis matrix (PAM) was used for the analysis. It is a computational framework that was developed in 1989 by Monke and Pearson and was augmented by recent developments in price distortions analysis (Waqar et al., 2005). It is a tool that is used to examine the impact of policy by constructing two enterprise budgets: one valued at market prices and the other valued at social prices. The PAM once constructed provides a convenient way of calculating the measure of policy effects and measures of competitiveness and economic efficiency/comparative advantage. A wide range of government policies have influences on protection and distortion of agricultural commodities which can be measured using nominal

protection coefficient (NPC) and effective protection coefficient (EPC) rates as indicators. PAM approach is basically an application of social cost benefit analysis and the basic concept of theory of policy analysis. The framework of the PAM is shown in Table 1.

Where
P_{id} = price of output i, P_{jd} = domestic price of tradable input j, P_{ib} = international price of output i
P_{jb} = international price of tradable input j, P_{nd} = market price of non tradable input n
P_{ns} = Shadow price of non-tradable input n, Q_i = quantity of output
Q_j = quantity of tradable input Q_n = quantity of non tradable input

The following are calculated on the PAM Table 1.

Private Profitability

Private profit refers to observed revenues and costs reflecting actual market prices received or paid by farmers, merchants, or processors in the agricultural system. The private profit is calculated on the first row of the table. The private profitability calculations show the competitiveness of the agricultural system, given current technologies, output values, input costs, and policy transfers. If private profits are negative (D < 0), operators are earning a subnormal rate of return and thus can be expected to exit from the activity unless something changes to increase profits to at least a normal level (D = 0). Alternatively, positive private profits (D > 0) are an indication of supernormal returns and should lead to future expansion of the system.

Social profitability

Social profits measure efficiency or comparative advantage. This is calculated in the second row of the PAM Table 1. When social profits are negative (H<0), a system cannot survive without assistance from the government. Such system wastes scarce resources by producing at social costs that exceed the costs of importing. A positive social profit indicates that the country is utilizing scarce resources efficiently.

Divergence

The second identity of the accounting matrix concerns the differences between private and social valuations of revenues, costs, and profits. For each entry in the matrix-measured verticallyany divergence between the observed private (actual market) price and the estimated social (efficiency) price must be explained by the effects of policy or by the existence of market failures. Divergence could be commodity market divergence or factor market divergence. However, the ratio indicators in PAM include:

Nominal protection coefficient (NPC)

Is use to establish the relationship between the market price and the shadow price of the rice processing and marketing commodity chains, (Fabian, 2005). A higher ratio indicates more government charges and taxes added to the border price, which raises the amount paid by citizens on imported items. The NPC greater than 1 reveals that producers are protected for the product. Similarly using input cost; NPC > 1 indicates producers subsidized for input purchase (Abdulkarim, 2008). The nominal protection coefficient can be obtained for both input (NPCI) and output (NPCO).

Nominal protection coefficient on output (NPCO)

The NPCO is calculated by dividing the revenue in private prices (A) by the revenue in social prices (E). The objective of calculating NPCO is to measure the actual divergences or distortions between domestic prices and international or border prices of output. If NPCO < 1, it confirms the presence of taxes (tariffs) on outputs. An NPCO > 1 shows the presence of subsidies. An NPCO= 1 reveals the absence of market failures or the absence of intervention in rice processing (Wayo, 2002; Wiendiyati, et al., 2002).

$$NPCO = \frac{A}{B} = \frac{P_{id}*Q_i}{P_{ib}*Q_i} \qquad (1)$$

Nominal protection coefficient on input (NPCI)

The NPCI is a ratio that contrasts observed (private) commodity prices with a comparable world (social) price. This ratio indicates the impact of policy transfers that cause a divergence between the two prices. The NPCI on tradable inputs in rice processing is therefore defined as private price of input (B) divided by social price of input (F). An NPCI > 1 shows that policies are increasing the market price above the world price, thus providing a positive incentive to the processors.A NPCI < 1 indicates a negative incentive (or disincentive) to the processors.

$$NPCI = \frac{B}{F} = \frac{P_{jd}*Q_i}{P_{jb}*Q_i} \qquad (2)$$

Effective protection coefficient (EPC)

This is compare to the added value at private price to added value at social price [EPC= (A-B) / (E-F)] which gives a combined index of the level of trade distortion on both tradable inputs and outputs in rice processing. It provides a more accurate measure of the level of protection than the NPC. EPC nets out the impact of protection on inputs and outputs, and reveals the degree of protection accorded to the value added process in the processing activity of the relevant commodity (Samarendu et al., 2003). An EPC > 1 means that the selected system is protected while an EPC < 1 means that the system generates fewer added values at market price than it would be at social price, and does not enjoy protection. EPC measures the protection according to the value- added rather than to finished products (Abda et al., 2011).

$$EPC = \frac{(A-B)}{(E-F)} = \frac{(Pid*Qi)-(Pjd*Qj)}{(Pib*Qi)-(Pjd*Qj)} \qquad (3)$$

Domestic resource cost (DRC)

This measures the efficiency of utilization of domestic factors in the analyses of processing systems. The DRC measure compares the cost of domestic resources at social (shadow) prices to value added at world prices (Oleg, 2010).

If DRC<1, the processing of the commodity in a country is competitive and enjoys protection.

If the DRC>1 it signifies that the country has a disadvantage in production of analyzing goods (Mikhail, 2005).

The balanced case is when DRC equals 1. Then the economy neither gains, nor saves foreign exchange through domestic production (Gorton et al., 2001).

The closer the DRC to 1, the more marginal is a country's comparative advantage or disadvantage in the production of that particular commodity (Gorton and Davidova, 2001 cited in Sabahudin, 2006).

$$DRC = \frac{G}{E-F} = \frac{(Pns*Qn)}{(Pib*Qj)-(Pib*Qj)} \qquad (4)$$

Masters and Winter-Nelson (1995) identified weaknesses of the DRC criterion. They demonstrated that the DRC understates the competitiveness of activities with intensive usage of domestic factors instead of tradable inputs. The activity with the highest level of

competitiveness does not necessarily maximize social profits, in other words its input mix is not optimal at given social prices. To correct for this, social cost benefit ratio was proposed by Siggel (2006).

Social cost benefit ratio (SCBR)

This is defined as the ratio of total resource cost (F+G) to the revenue (E). SCB is superior to domestic resource cost (DRC) indicator, which is another widely applied indicator of comparative advantage. It is interpreted like the DRC, that is, SCBR above one indicates that the selected system does not have a comparative advantage. The SCBR is consistent with the DRC in the sense that a given system with a DRC>1 will necessarily have a SCBR>1 (Frederic, 2005). The SCBR was developed as an alternative to the DRC because it is demonstrated that for ranking the comparative advantages of different systems, the DRC is biased in favour of activities that have a relative higher content in tradable input than domestic factors (Master, 2003). Mathematically, this is expressed as;

$$SCBR = \frac{F+G}{E} = \frac{(P_{ij}*Q_j)+(P_{ns}*Q_n)}{P_{ib}} \qquad (5)$$

Financial cost benefit ratio (FCBR)

This is the value of the domestic factors above the value added created at market price. If this ratio is above one, it means that the systems utilize more value of domestic factors than the wealth created or the value added, and then the system is not profitable. If the FCBR<1, the system is profitable; therefore the system that are the most profitable are the one that have the FCBR closest to zero.

$$FCBR = \frac{C}{AB} \qquad (6)$$

Subsidy ratio to producers (SRP)

Compares the net transfer to the revenue at social price (L/E) and provides another measure of the magnitude of the transfer induced between the selected systems and the rest of the economy. It indicates the part of the profits in social prices, which is required when a single subsidy or tax is received for all the commodities and macroeconomic policy (Christo, 2010). SRP permits comparisons of the extent to which all policy subsidises agricultural systems (Wayo, 2002). In case of positive aggregated transfer (L>0), it indicates the magnitude of the world price increase that would be required for the

selected system to have a comparative advantages, if it is negative, it is an indication that no subsidy/transfer is received by the producer (Frederic, 2005).

$$SRP = \frac{L}{E} \qquad (7)$$

Equivalent producer subsidy (EPS)

Is a ratio of the total net transfer (L) above revenue at private price. It indicates the share of income gained (or lost) for the system due to distortions induced by the current policy or market distortions. This ratio has been widely used as an instrument to measure and monitor the aggregated level of protection to a subsector during trade negotiations (Master, 2003).

$$EPS = \frac{L}{A} \qquad (8)$$

Private profitability coefficient (PPC)

Is a ratio of the private opportunity costs of domestic factors of production relative to the value added in domestic prices. It shows the extent to which private profit exceeds social profit (Wiendiyati et al., 2002). It measures the comparative advantage an entrepreneur has in producing value-added rice (Oguntade, 2011). A PPC less than one indicates positive private profit and shows that the production system is competitive for resources given the actual prices in the product and factor markets. The lower the PPC, the greater is the degree of competitiveness (Elly and Lis, 2004).

$$PPC = \frac{D}{H} \qquad (9)$$

Sensitivity analysis

Sensitivity analysis is an analytical technique to test systematically what happens to the earning capacity of a commodity system if events differ from the estimates made about them in planning (Wayo, 2002). Many criticisms have been given to the use of PAM in policy analysis because it is viewed as being static in nature and that its result could be unrealistic in a setting that is dynamic (Nelson and Pangabean, 1991). A sensitivity analysis is done by varying one element and determining the effect of that change on the outcome. To correct for this, the study adopted sensitivity analysis under the following assumptions: The analysis was carried out to test whether the result would be affected or changed by

Table 2. Policy analysis matrix for rice processing.

Revenue	Tradable Inputs	Non-Tradable Inputs	Divergence	
Private price	293800	166,129.89	28,607	99,063.11
Social price	193419.2	181,062.41	17,195.13	-4,838.3
Divergence	100380.8	-14,932.5	11,411.9	103,901.4

Source: Field survey, 2011.

Table 3. Measures of protection in rice processing.

Ratio Indicators	Values
FP(₦)	₦ 99,063.11
FCBR	2.3
SP (₦)	-4,838.3
DRC	1.41
TRANSFERS	103,901.4
NPCI	0.92
NPCO	1.52
EPC	10.33
PC	-20.5
PSR	0.57
EPS	0.35
SCBR	1.03

changes in the exchange rate (increase and decrease), output (increase and decrease) by 10%. It is a means of dealing with uncertainty about future events. Objective three was achieved using descriptive statistics such as flowcharts, percentages, tables, and cumulative frequency.

RESULTS AND DISCUSSION

Policy analysis matrix for rice processing

The policy analysis matrix for rice processing is shown in Tables 2 and 3. The results revealed that the private profit for rice processing in the area for the output of 1 hectare of land (2 metric tonnes) is positive (₦99, 063.11) considering the existing technologies, input and output prices and prevailing policies. The positive profit implies that rice processing in the area is competitive and that processors are earning a supernormal return. Conversely, the social profit was negative (₦4, 838.3) given current technologies, input and output prices and policy. This indicates that the cost of domestic processing exceeds the cost of importation thereby suggesting that the enterprise cannot survive without government intervention at the margin. The negative social profit is also an indication that resources are not being efficiently utilised in the processing of the commodity (paddy).

Table 3 reveals that the NPCO was greater than unity (1.52) which implies that policies actually favoured the domestic rice output. This finding is a true reflection of the government's policy that currently places a tariffs/import duty of up to 50% on the importation of the value added rice commodity in Nigeria. This confirms the findings of Oguntade (2011) on assessment of protection and comparative advantage in rice processing in Nigeria that NPCO was 1.74 indicating that the policy was friendly on rice output. However, the NPCI was 0.92 implying that policies taxed the input of rice processing, but contradicts his finding on NPCI that was greater than unity (1.27). The EPC which reveals the extent of protection given to the value added process was greater than unity (10.33). Similarly, the DRC coefficient was greater than unity (1.41). This is a clear indication that it is not socially profitable to process paddy rice into value-added rice in the area. In other words, it is an indication of resource use inefficiency in rice processing in the area. The DRC value was further confirmed by the SCBR value of 1.03. This finding is also in tune with the findings of Akande et al., (2007) that DRC was 1.41 indicating that policy was not friendly on rice production (Table 4).

In the second scenario, when the exchange rate was increased by 10% and reduced by the same proportion, DRC values were still greater than unity. This was further confirmed by the values of their SCBR which were all greater than unity. The NPCI values were not sensitive to output variation as the remained unchanged (0.92) but were found sensitive to exchange rate changes. Similarly, NPC values remained unchanged to changes in output. It was reduced by 9% and increased by 11% when the exchange rates were increased and reduced by 10% respectively. They values were all greater than unity confirming that international prices were lower than unity.

Policy analysis matrix of rice marketing

The results of the PAM for rice marketing in the study area revealed that rice marketing in the study area was not privately profitable (₦9, 563.33). This was further confirmed by the financial cost benefit ratio (FCBR) which was greater than unity (4.03). However, the result indicated that it was socially profitable (₦8, 474.22). The positive social profit is an indication that the enterprise

Table 4. Sensitivity analysis of rice processing.

Coefficients/ ratios	Base value	10% increase in output	10% decrease in output	10% increase in exchange rate	10% decrease in exchange rate
FCBR	2.3	0.18	0.29	1.88	0.22
SP	-4,838.3	14,503.35	-24,180.82	-3,665.99	-4,370.35
DRC	1.41	0.54	-2.46	1.24	1.39
TRANSFERS	103,901.4	111,939.59	93,863.45	102,729.1	103,433.5
NPCI	0.92	0.92	0.92	0.84	1.02
NPCO	1.52	1.52	1.52	1.38	1.69
EPC	10.33	4.95	-14.7	8.37	11.5
PC	-20.5	8.9	-2.88	-27	-22.66
PSR	0.57	0.54	0.54	0.48	0.59
EPS	0.35	0.35	0.35	0.35	0.35
SCBR	1.03	0.93	1.05	1.02	1.03

Table 5. Policy analysis matrix of rice marketing.

Revenue	Tradable Inputs	Non-Tradable Inputs		Profit
	(₦)	(₦)	(₦)	(₦)
Private Price	299,000	295.844	12,719.33	9,563.33
Social Price	213,200	195.089.2	9,636.58	8,474.22
Divergences	85,800	100,754.8	3,082.75	-18,037.55

Source: Field survey, 2011.

Table 6. Ratio indicators for rice marketing.

Indicators	Values
FP	-₦9,563.33
FCBR	4
SP	₦8,473.22
DRC	0.53
TRANSFERS	-₦ 18,037.33
NPCI	1.5
NPCO	1.4
EPC	0.17
PC	-1.13
PSR	0.085
EPS	0.06
SCBR	0.96

can survive without government intervention at the margin.

The net effect of divergence between the private profit and social profit was negative (₦ 18, 037.33). This suggests that the net effect of policy intervention by the government at the marketing level reduced the profitability of rice marketing in the area which is not marketer-friendly (Table 5).

Measures of protection

Table 6 presents the ratios of protection coefficients and competitiveness of rice marketing in the study area.

Table 7 presents sensitivity analysis of rice marketing. The result showed that NPCO and NPCI were 1.4 and 1.5 respectively implying that the domestic market price of value-added rice has been kept above the international price of rice through the intervention of the government policies. This conforms to the findings of Oguntade (2011) that NPCO and NPCI were 1.74 and 1.27 respectively. Despite the tariff imposition on the imported rice, the EPC (0.17) shows that rice marketers were not protected in the area. This implies that the level of protection was not enough to completely protect the marketers. However, the DRC which is a measure of comparative advantage in marketing which a nation has in producing a commodity indicates that rice marketing was socially profitable (0.53). This finding conforms to the findings of Ramtin and Farhad (2010).

Meanwhile, the SCBR value of 0.96 further confirmed the authenticity of the DRC value which was less than unity. In the first scenario, volume of trade was increased by 10% and also reduced by the same proportion. The PC values were still less than unity irrespective of the changes in the volume of trade. However, the value of NPCI and NPCO were still not sensitive to changes in

Table 7. Sensitivity analysis of rice marketing.

Coefficients/ratios	Value	10% increase in output	10% decrease in output	10% increase in exchange rate	10% decrease in exchange rate
FP	₦9,563.33	20,336.67	-39,463.33	₦9,563.33	₦9,563.33
FCBR	4	0.38	-0.48	4.0	4.0
SP	8,474.22	48,967.38	12,745.8	9,000.45	7.625.6
DRC	0.53	1.5	-3.1	0.54	0.71
TRANSFERS	18,037.55	-28,630.7	-26,717.55	-18,563.76	-17,189.13
NPCI	1.5	1.5	1.5	1.38	1.68
NPCO	1.4	1.4	1.4	1.27	1.56
EPC	0.17	0.84	8.6	0.16	0.19
PC	-1.13	0.42	-3.1	-1.06	-1.25
PSR	0.085	-0.122	0.15	-0.08	-0.09
EPS	0.06	-0.09	-0.06	-0.06	-0.06
SCBR	0.96	0.87	0.96	0.96	0.96

output. In the same vein, the exchange rate was increased by 10% and also reduced by the same proportion. This change showed that indicators like DRC, NPCO, EPC, PC, and PSR were sensitive to exchange rate variation except for SCBR, EPS, FCBR and FP. This clearly implies that an appreciation of international currency (US dollar) against local currency (naira) will favour domestic rice marketing. This finding conforms to Ogbe et al. (2011) on competitiveness of Nigerian Rice and Maize Production Ecologies.

CONCLUSION AND RECOMMENDATIONS

Research findings have shown that rice processing and marketing in the Ebonyi State is profitable. However, the enterprises will be severely affected if the government protection policies are removed since past government inconsistent policies were not successful in securing good market shares for domestic rice processors and marketers, hence they suffered great losses. The recent and renewed interest by the present administration to intensify domestic rice enterprise has yielded positive results. The current 50% tariff on imported rice should be further increased to give more protection to local rice processors and marketers since the already existing policy does not guarantee complete protection. Meanwhile, more private sector participation should be encouraged. This can be done through institutional market support services in the area of credit, market infrastructures, and conducive policy environment. These measures will go a long way in commercializing the enterprise not just in Ebonyi State but in the entire country.

REFERENCES

Abda AE, and Mohammed HS (2011). Measuring of Competitiveness of Sudanese Sheep Export. Am. J. Exp. Agric., 1(3): 69-78, 2011.

Abdoulkarim E (2008). Measuring Competitiveness of Shrimp Farming in Southern Iran: Using PAM Approach. Department of Agricultural Economics, College of Agriculture, Shiraz University, Shiraz, Iran. World Appl. Sci. J., 4(5): 724-729, 2008.

Akande T, Cisse Y, Kormawa P (2007). Streamlining Policies for Enhancing Rice Production in Africa; Past Experiences, Lessons Learnt and the Way Forward. Afr. Crop Sci. J., 14(4): 223-235.

Akpokodje G, Lankon F, Ernestein O (2001). Nigeria's Rice Economy: State of the Art, Draft Report Submitted to WARDA, Bouake, Cote d'/Vireo November, 2001.

Amaza PS, Maurice PC (2006). "Identification of Factors that Influence technical Efficiency in Rice-Based Production Systems in Nigeria. Proceedings of a Workshop: Rice Policy and Food Security in Sub-Saharan Africa" held on 7-9 November, 2005 in Cotonou, Benin.

Atungwu JJ (2005). Evaluation of Lowland Rice for Resistance to Root –knot Nematode.

Bamidele FS, Abayomi OO, Esther OA (2010). Economic Analysis of Rice Consumption Patterns in Nig. J. Agric. Sci. Technol., 12: 1-11.

CBN (1998). Central Bank of Nigeria, Annual Report Statement of Account.

Christo J (2010). The competiveness and efficiency of the South African Broiler Industry. A Publication of the National Agricultural Marketing Council, South Africa. June, 2010.

Elly R, Lis N (2004) The Competitiveness and Efficiency of Potato Farming in Pangalengan. Research Institute of Padjadran University.

ERDD (2011). Economic Research Division Directorate; Competitiveness of South African Agricultural Products in European Union Markets. 2011 Annual Publication of the Ministry of Agriculture, Forestry and Fisheries,

South Africa.

Fabian T (2005). Commodity Chain Analysis; Impact Analysis Using Shadow Prices . Food and Agricultural Organisation of the United Nations, Rome, Italy. Pg 17

FGNOG (2009). Federal Government of Nigeria Official Gazette on National Rice Development Strategy (NRDS). A Paper prepared for Coalition for African Rice Development (CARD) (2009). Vol. 96 Annexure B, West Africa Rice Development Association (WARDA)Abidjan, Côte d'Ivoire.

Frederic L (2005). Comparative Advantage Study; A Technical Report of the Ministry of Agriculture and Agrarian Report, National Agricultural Policy Centre, Italy.

Gorton M, Ayemen F, Ayeage N (2001). The International Competitiveness in Romanian Agriculture; A Paper Presented to Romanian Accession to EU: Agricultural Conference, Bucharest, 17th-18th November, 2001.

Gorton M, Davidova G (2001). Farm Productivity and Efficiency in the CEE Applicant Countries. A Synthesis of Results. J. Agric. Econ., 30: 185-250.

Joseph OB (2007). Analysis of the Relationships of Factors Affecting Rice Consumption in a Targeted Region in Ekiti State, Nigeria. J. Appl. Quantitative Method., p. 1.

Kormawa P, Toure A (2005). Global Rice Trade: Dynamics, Policy Conflicts and Strategies in Africa. Conference on International Agricultural Research for Development, Tropentag Stuttgart-Hohenheim, October 11-13, 2005, Cotonou, Benin Republic.

Lancon F, Erenstein O, Akande SO, Titiola SO, Akpokoje G, Ogundele OO (2003). The Nigerian Rice Economy in a Competitive World; Constraints, Opportunities, and Strategic Choices. West African Rice Development Association (WARDA): Bouake Cote d'voire, A Study Report.

Master WA (2003). Policy Measurement for Trade Negotiations and Domestic Reforms, presented at a Panel on Concept and Measurement in International Competitiveness at the International Industrial Organization Conference, Northeastern University April 2003, p. 17.

Masters WN (1995). Guidelines in National Comparative Advantage and Agricultural Policy Analysis Project, Phase III. USAID Contract No IAG-4201-c-00-3052-00.

Mikhail R (2005). Policy Analysis Matrix: An Analysis of Diary Sector in Belarus Centre, kiel Germany.

Mkpuma U (2007): Economics of Rice Processing and Marketing in Abakaliki Local Government Area of Ebonyi State. An Unpublished B. Agric. Tech. Project Submitted to The Department of Agricultural Economics, Federal University of Technology Owerri, Imo State.

Momoh S (2007). Nigeria Faces Rice Shortage as World Supplies Dwindles http//www.tradnet.biz// groups Monke E, Pearson SR (1989): The Policy Analysis Matrix for Agricultural Development. Ithaca, N.Y, USA.

Cornel University Press.

Nelson GC, Panggabean M (1991). The Cost of Indonesian Sugar Policy: A Policy Analysis Matrix Approach, Am. J. Agric. Econ., 73: 703-712.

Neptune L, Jacque A (2007). Competitiveness of Cocoa Production Systems in Trinidad and Tobago. Proceeding of the 26th West Indies Agricultural Economics Conference (Caribbean Agro-Economics Society) in collaboration with the 42nd Caribbean Food Crops Society Meeting.

Nordin ABA, Shariff FM, Simeh AS, Baharim B (2008). FutureCompetitiveness of the Malaysian PKE. Oil Palm Industry Econ. J., 8(2).

NPC (2006). National Population Commission Publication on 2006 Human Census.

Odu OO (2010). Effects of Credit Constraints on Profit of Small Scale Rice Farmers in Niger State, Nigeria; An Application of Profit Based Efficiency Measures. An Unpublished M. Phil Thesis Submitted to The Department of Agricultural Economics, University of Ibadan.

Ogbe OO, Okoruwa VO, Saka OJ (2011). Competitiveness of Nigerian Rice and Maize Production Ecologies: A Policy Analysis Matrix Approach. Trop. Subtrop. Agroecosyst. J., 14(2011): 493-500.

Ogundele (2003). The Nigerian Rice Economy in a Competitive World: Constraints, Opportunities and Strategic Choices Rice production systems in Nigeria: A survey.

Ogundele OO (2003). Technical Differentials and Resource –Use Efficiency in Kaduna State. An Unpublished PhD Thesis Submitted to The Department Of Agricultural Economics, University of Ibadan, Nigeria.

Oguntade AE (2011). Assessment of Protection and Comparative Advantage in Rice Processing in Nigeria. African Journal of Food, Agriculture, Nutrition and Development; AJFAND Online Scholarly Peer Reviewed, 11(2): 34-41.

Okoruwa VO (2006). Technical Efficiency Differentials in Rice Production Technologies in Nigeria; A Case Study of North Central Nigeria. Department of Agricultural Economics, Faculty of Agriculture and Forestry, University of Ibadan.

Olaf E, Frederic L, Akande SO, Titilola SO, Akpokodje GOO, Oleg N (2010). A Note on Technical Efficiency, Productivity Growth and Competitiveness. Poster prepared for presentation at the Agricultural & Applied EconomicsAssociation 2010 AAEA, CAES, & WAEA Joint Annual Meeting, Denver, Colorado, July 25-27, 2010.

Ramtin, F (2010). Comparative Advantage and Support Indices of Orange in Mazandran Province of Iran. p. 11.

Saka JO, Lawal BO (2008). Determinants of Adoption and Productivity of Improved Rice Varieties in South-western Nigeria. Afr. J. Biotechnol., 8(19): 4923-4932

, 5 October, 2009.

Samarendu M, Cheng F, Jagadanand C (2003). Assessing the Competitiveness of Indian Cotton Production:A Policy Analysis Matrix Approach. J. Cotton Sci., 7: 65–74 (2003) 65.

Siggel E (2006). International Competitiveness and Comparative Advantage: A Survey and a Proposal for Measurement. J. Industry Competition Trade, 6(2): 137-159.

UNIDO (2008). Technical Assistance for Energy Efficiency Improvement in rice Mill   Cluster   in Abakaliki; Specifications of Modern Mini Rice Processing Plant of 2.5-3 ton/hour of Paddy.

USAID (2005). Package of Practices for Rice Production.

USAID (2008). Agricultural Value Chain Financing in Kenya. An Assessment of Potential Opportunities for Growth.

USAID (2009). Agricultural Value Chain Financing in Kenya. An Assessment of Potential Opportunities for Growth.

Waqar A, Muhammed S, Nadeem A (2005). Analysis of Economic Efficiency and Competitiveness of Rice Production Systems in Pakistan Punjab.

Wayo AS (2002). Agricultural Growth and Competitiveness under Policy Reforms in Ghana. A Technical Publication No 61. Institute of Statistical, Social and Economic Research (ISSER), University of Ghana, Legon.

Wiendiyati U, Reku R, Paulus U (2006). The Impact of Tariff Policy and Inter-Island Transport Costs on the Profitability of Soyabean Production in Ngada Regency, Nusa Cendana University.