GROSS MARGIN ANALYSIS OF MARKETING PADDY RICE *(Oryza sativa)* IN SELECTTED MARKETS IN BAUCHI STATE, NIGERIA

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ABSTRACT
The study examined the gross margin and factors influencing marketing margin, as well as constraints to paddy rice (Oryza sativa) marketing in selected markets in Bauchi State, Nigeria. Six (6) markets were purposively selected and a total of 124 marketers were randomly chosen. Primary data were collected by the use of structured questionnaire. Descriptive and inferential statistics were used to analyze the data. Based on the findings of the study, paddy rice marketing was a profitable enterprise in Bauchi State, Nigeria with gross margin of N1,126.20 and marketing efficiency was 13.5%. Factors that influenced marketing margin of paddy rice include marital status at $P \leq 0.01$, household size at $P \leq 0.1$, years of experience and educational level at $P \leq 0.05$, respectively. The result indicates that the model has an F-ratio (11.562) which shows that the whole model was significant at $P \leq 0.01$ level of probability. The coefficient of determination (R^2) indicated that 45.5% variation in the dependent variable was explained by the explanatory variables included in the model, while the remaining was as a result of variables not included in the model as well as errors in estimation. The results further revealed that 48.4% of the market participants were retailers. The major constraints identified include inadequate capital, poor road network and storage facility, seasonality of supply and lack of standard unit of measurement. It was recommended that Government provides credit facilities; improved transportation network and marketers encouraged to form cooperatives so that they can pool their resources together to increase their scale of operation.

Keywords: Gross returns, Markets, Marketing margin, Market participant, Paddy rice.

INTRODUCTION
Rice *(Oryza sativa)* is one of the major cereal crops of the tropical regions of the world. It ranks second among the stable food crops in Nigeria. Its production, processing, storage and distribution are therefore of significant importance not only to the average Nigerian household but also to Federal Government. The desire to be self – sufficient in rice production was what necessitated the ban on its importation in 1985 (Nwele, 2016).

United States Agency for International Development (USAID, 2004), classified the crop as the most important food depended upon by over 50% of the world population for about 80% of their food needs. The demand for rice in Nigeria is growing at a faster rate than domestic supply. The domestic supply is 2.3 million metric tons per annum, while the demand is 6.3 million metric tons per annum. This leaves a wider gap of 4 million metric tons which is the highest in Africa as of 2016 (Nwele, 2016). Furthermore, it was noted that rice has become a staple food of choice in both urban and rural areas accounting for more than 20% of all meals consumed per week by a typical household. Nigeria's growing demand for rice is forecasted to

reach 36 million metric tons by 2050, thus it is significant to ascertain its marketing and the opportunity it can offer Nigeria in terms of employment and income generation Federal Ministry of Agriculture and Rural Development (FMARD, 2011). Despite efforts by both federal and State Governments to provide domestic rice for consumption as well as reducing importation of rice, such may not be fully realizable without proper processing and marketing channels activities.

In the olden days, agricultural marketing involved, in its simplest form, the buying and selling of agricultural produce, when the village economy was more or less self-sufficient, and farmer sold their produce to the consumer directly on a cash or barter basis. But in modern times, marketing of agricultural produce is different from that, as in modern marketing, produce has to undergo a series of transfers or exchanges from one hand to another before it finally reaches the consumer.

Rice marketing covers the performance of all business activities in the flow of paddy and milled rice from the point of production to the consumer in the right place and form (Mou, 2014). The marketing system is still undeveloped and lack institutional support. Few policy initiatives on rice by successive governments of Nigeria have been focused on the supply side (intensive production) with little emphasis on marketing and distribution. But increasing production without a corresponding efficient marketing strategy being put in place to ensure its accessibility would not stimulate farmers to enhance production.

The gross margin analysis, the factors influencing paddy rice marketing in the study area have not been fully explored. It was against this background the research was conducted. The specific objectives were to:

i. determine the gross margin and marketing efficiency of paddy rice marketers;
ii. determine the factors influencing marketing margin of paddy rice; and
iii. identify and describe the constraints associated with the paddy rice marketing.

MATERIALS AND METHODS
The Study Area
The research was conducted in Bauchi State, Nigeria; Bauchi State is located in the north eastern region of Nigeria. It is located on latitude 9^03^1 to 12^03^1 north of the equator and longitude 8^05 and 11^0 of the Greenwich meridian Bauchi State Agricultural Development Programme (BSADP, 2015). The State has 20 local government areas (LGAs) and three agricultural zones with a total land mass of 49,119km^2 representing about 5.3% of the Nigerian total land area, (BSADP, 2015). The estimated population was 4,889,811 National Berau of Statistics (NBS, 2015). The climatic condition is characterized by two distinct seasons, dry and wet seasons with rainfall ranging from 700mm in the extreme Northern parts and 1300mm in Southern parts of the State, while temperature ranges from 9.11^0 C to 40.55^0C (BSADP, 2015).

The vegetation types are conditioned by the climatic factors, which in turn determine the amount of rainfall received in the area. For instance, the Southern part of Bauchi State receives high amount of rainfall compared to the Northern part of the State. It has loosed soil and clay soil. The vegetation is typically Northern Guinea Savanna type made of grasses and herbaceous plants. Trees are scattered and do not form a canopy. The human settlement in the area are essentially of rural setting with few urban and semi – urban environments (BSADP, 2015).

The major economic activities of the area are agriculture with a combination of trade, art and craft practiced by the people. The crops produced by most of the farmers in Bauchi State include rice, maize, millet, groundnut, cowpea, sesame, sorghum, while livestock include cattle, sheep and goat, and poultry.

Sampling Procedure and Sample Size

Two stage sampling technique was employed which include purposive and random sampling. In the first stage all the three (3) agricultural zones were selected (namely: Central, Northern and Western). The second stage consists of purposive selection of two (2) LGAs from each zone making a total of six (6) (Table 1). This is because they are the major marketers of paddy rice in the State. In the third stage two (2) markets were purposively selected from each of the Agricultural zone within the selected LGAs making a total of 6 (6) markets. Finally, a sample of 124 paddy rice marketers were selected using simple random sampling technique (Table 1).

Table 1: Sampling Frame and Sample Size

Zones	LGAs	Markets	Population of marketers	Sample size (10%)
Central	Ningi	Gadan maiwa	250	30
	Ganjuwa	Soro	284	25
Western	Dass	Dass	156	15
	Bauchi	Mararraba	180	16
Norther	Jama'are	Jama'are	191	20
	Gamawa	Gamawa	188	18
Total			**1249**	**124**

Source: Field survey, 2018

Method of Data Collection

Primary data were used for the study. The primary data were obtained from the paddy rice marketers using structured questionnaire and oral interview. The information that was collected include: socio-economic, marketing channels, cost and return, conduct, performance, efficiency and the constraints associated with the paddy rice marketing in the study area.

Analytical Techniques

Simple descriptive statistics such as measure of central tendencies, percentage, range, frequency were used to achieve objectives of the study. Also, gross margin was used to determine the costs and returns associated with paddy rice marketing. The gross margin method was used on the assumption that fixed cost of marketing is negligible. The model is explicitly expressed as:

GM = GR – TVC   … (1)

where;

GM = Gross Margin paddy rice (₦/100kg/ bag)

GR = Gross Revenue paddy rice (₦100kg/ bag)

TVC = Total Variable Cost paddy rice (₦/100kg / bag)

RESULTS AND DISCUTION

The gross margin analysis of paddy rice marketing is presented in Table 2. The average purchase cost was ₦7, 741.60, average cost of transportation was ₦197.70, average cost of empty bag was ₦161.60, average cost loading and offloading amounted to ₦77.90, average tax was ₦50 and finally the average cost of labour for each 100kg bag of paddy rice amounted to ₦88.40. The total variable cost incurred in paddy rice marketing in the study area amounted to ₦8, 317.20 the gross revenue was found to be ₦9,443.40 while the marketing efficiency was 13.5%. The gross margin equals to ₦1,126.20. This implies that paddy rice marketing in the study area was profitable since it is believed that if a business can recover its variable cost, then it is capable of continuing in the short run. This collaborates with the work of Ibitoye (2012),

who found that greater gross margin leads to profit maximization which is prime objective of marketer.

Table 2: Gross margin of paddy rice marketers in the study area

Items	Average amount in ₦ (100kg bag)
Gross Revenue	9,443.40
Variable cost (VC):	
Purchase Cost	7,741.60
Transportation cost	197.70
Cost of empty bag	161.60
Cost of loading and off-loading	77.90
Taxes	50.00
labor	88.40
total variable cost (TVC)	8,317.20
Gross margin (GM)	1,126.20
Marketing efficiency (GM/TVC*100)	13.5%

Source: field Survey, 2018

The results from Table 3 revealed that household size was significant at 10% while marital status was significant at 1%. Level of education and marketing experience were found to be positive and significant at 5%, respectively. This indicates that a unit increase in these variables will increase the marketing margin by 0.138 and 0.322 respectively. This implies that the higher the level of education the higher level of the adoption of modern marketing which will be evident in higher output and the overall net return. This agreed with the finding of Bassey *et al*. (2013), on their study of rice traders in South-south Nigeria.

Table 3: Factors Influencing Marketing Margin of the Paddy Rice Marketers

Variables	Coefficient	T-Value	SE	Sig Level
Constant	0.556	0.520	1.068	0.152ns
Age	-283	-1.154	0.245	0.178ns
Marital Status	-466	-3.714	0.125	0.005**
Household level	0.339	2.728	0.122	0.000***
Years of experience	0.322	2.611	0.123	0.036*
Level of education	0.138	1.697	0. 081	0.012*
Transport cost	0.099	0.909	0.109	0.996ns
Tax	0.080	0.217	0.083	0.890ns
R^2 0.455				
R^2adjusted 0.416				
F-value 11.562				

Notes: *** significant at 10%, **significant at 1%,*significant at 5% and NS = not significant
Source: Output from SPSS, 2018

As presented in Table 3, marital status was significant at 1% but had a negative coefficient. This implies that the married ones who are in the enterprise made less profit than their unmarried counterparts. This is because the married one has more family responsibility and the enterprises serve as their source of livelihood for the family. This agrees with the findings of Achike and Anzaku (2010).

Level of Participants and Source of Market Information

Market participants involve individuals, groups and organizations that handle products at various levels (wholesale and retail) of the markets as the product passes from the producer to the final consumer. The distribution of market participants for paddy rice is presented in Table 4. The result revealed that wholesalers, retailers and agents of paddy rice in the study area constituted 31.5%, 48.4%, and 20.1%, respectively. This implies that retailers dominated the marketing of paddy rice in the study area. This therefore, follows as a matter of logic that prices of paddy rice in the study area would be relatively high. This is because more marketing function such as selling in small unit, storing for relatively longer period of time and bringing the products close to consumers thereby adding more utilities of possession, place and time. This revelation is in line with the work of Agwu and Ibeabuchi (2011), reported that more marketing functions are performed at the retail level of commodity chain. The cost of the various functions which eventually provides more utilities to the product is transmitted to the final consumer at higher prices. The result further revealed that 42.7% of the marketers purchasing unit was from rural assemblers and this implies that the marketers bought their goods at a very cheap price from the main producers. This could also translate to higher profit.

Table 4: Distribution of Paddy Rice Marketers according to Level of Participants and Source of Market Information in the Study Area

Variables	Frequency	Percentage
Types of intermediaries:		
Wholesalers	39	31.5
Agents	25	20.1
Retailers	60	48.4
Purchasing point:		
Farm gate	32	25.8
Rural assembler	53	42.7
Source of market information:		
Agent	22	17.7
Fellow marketers	84	67.7
Media/electronic means	10	8.0
Others	8	6.5

Source: Field Survey, 2018

Market information is the knowledge on the market situation in terms of supply, demand, supply sources and location, quality and variety of products and the prices of the commodities in the market. The marketers who are privileged to obtain private market information on new products can obtain windfall gains, and not necessary because of their trading skills. According to Agwu and Ibeabuchi (2011), lack of public media for disseminating information on agricultural produce supply, demand prices often causes market imperfection. The result from Table 4 below showed that majority (67.7%) of the rice marketers obtained market information from their colleagues, while sources of information from media/electronic, and agent constituted 8.0%, and 17.7%, respectively. This is consistent with the findings of Sunday and Alex (2009), who reported that merchants, market place, colleagues, selling agents, retailers were the most important sources of market information in the market they operate.

Constraints Faced by Paddy Rice Marketers

The constraints to paddy rice marketing in the study area are presented in Table 5. The results revealed that the most important constraint faced by all the paddy rice marketers (100%) was inadequate capital. Problems of poor road network, poor storage facilities, lack of standard unit of measurement and seasonality of supply constituted 95.9%, 79%, 44.4%, and 54%, respectively. This was in line with the findings of Uduji and Mohammed (2012), who reported that constraints of paddy rice marketing in Kogi State, Nigeria were; inadequate capital, improper standardization of rice in the market place, existence of an inefficient and inadequate storage system, and poor access roads to convey the produce from the farm-gate to the market.

The finding is consistent with Ibitoye (2012), who reported that the major problems limiting palm oil marketing in Dekina local government of Kogi State are inadequate capital, price fluctuation and high transportation cost. These problems combined together could have negatively affected the marketing margin of rice marketers in the study area. The inadequate capital by the marketers could be attributed to their dependence on only personal savings as source of funds to the business.

Small-scale traders may lack suitable collateral which is a pre-condition to obtain loan from bank. The economic implication of this result is that the scale of marketing in the study area will remain small with slow growth rate due to relatively small personal savings unless efforts are made to provide credit facilities in the form of soft loans to rice marketers. This could help them increase their sales volumes hence, enjoy economy of scale.

Table 5: Constraints Associated with Paddy Rice Marketers in the Study Area

Variables	*Frequency	Percentage (%)	Position
Inadequate capital	124	100	1st
Poor road network	119	95.9	2nd
Poor storage facility	98	79	5th
Seasonality of supply	67	54	6th
Lack of standard unit of measurement	55	44.4	7th

*Multiple responses were recorded.
Source: Field Survey, 2018

CONCLUSION AND RECOMMENDATIONS

Based on the findings of the study, paddy rice marketing was found to be profitable enterprise in the study area with high marketing efficiency. There is possibility for increase profit in the study area if major constraints such as inadequate capital, poor road network, inadequate storage facilities, lack of standard unit of measurement seasonality of paddy rice supply to market and are tackled by both the government and marketers of paddy rice. The following recommendations were made:

1. There is the need to provide credit facilities in the form of soft loans with low interest rate to paddy rice marketers. This would enable small scale marketers increase their sales volume and hence, enjoy economy of scale. This should be done by commercial banks, microfinance bank, money lenders and other stakeholders.

2. Agencies such as Rural Development Agency, State Development Board, State Agricultural Development Programme and other relevant agencies that are involved in the construction of roads should extend such to the localities where rice is produced. Also, effort should be directed towards reducing transportation cost which could translate in reducing marketing cost. This can be achieved by evolving well-coordinated transport facilities in Bauchi State.

3. Paddy rice marketers should be encouraged to form cooperative association to enable them have easy access to credit facilities. They can also be able to forecast, predict and analyze price, thereby increasing marketing margin in the study area.

4. Dry season farming should be encouraged by both the governments and stake holders so as to make paddy rice available throughout the seasons. Also excess during harvest period can be bought and stored by government and then released during period of scarcity so as to equate demand with supply.

5. There is the need for efficient transmission of price information among the market participants in the markets through the establishment of market information centers to facilitate adequate communication and flow of information (on market price, buyers' preference and demand) between markets. This can reduce the disparity in flow of rice marketing information between the paddy rice marketers.

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