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Capacity utilization of small scale oil palm fruit processing mills in Ikot Ekpene agricultural zone of Akwa Ibom State, Nigeria

Akpan, S. B.* and Akpan, E. M.

Department of Agricultural Economics and Extension, Akwa Ibom State University, Obio Akpa Campus, Akwa Ibom State, Nigeria:

*Corresponding author (Email: sundayakpan@aksu.com.)

ABSTRACT

The study analyzed the capacity utilization rates of the oil palm processing mills in Ikot Ekpene Agricultural Zone of Akwa Ibom State, Nigeria. A three-stage sampling technique was used to randomly select sixty (60) oil palm fruit processing mills in the study area. Cross-sectional and time series data were collected from the oil palm processors. The study used descriptive statistics and regression analysis based on the ordinary least squares estimation method. The result obtained showed the mean capacity utilization rate of 53.04%, implying that the oil palm fruit processing mills have the unused capacity or capacity gap of 46.96% relative to the potential capacity. The empirical results showed that education, processing experience, the quantity of raw materials (fresh oil palm fruits), labour cost, loan acquisition, cost of fuel, tax paid and the extent of mechanization of the mills were the determinants of the capacity utilization rates of the oil palm fruit processing mills. For an enhanced capacity utilization rate of the oil palm fruit processing mills in the State, it is recommended that the quality of education of the processors should be improved, while the mechanisms to lower the cost of labour and fuel expenditure should be implemented in addition to increasing the oil palm fruit supply to the processing units and credit accessibility.

Keywords: Processors, capacity, oil palm, utilization, firm, Akwa Ibom, Nigeria

INTRODUCTION

Techniques for processing oil palm (*Elaeis guineensis*) fruits vary with available technology (Afoakwa and Skyi-Dawson 2013). There are three types of oil palm processing techniques and these are the traditional, semi-mechanized and industrial oil palm fruit processing techniques (Ataga *et al.*, 1993 and Afoakwa and Skyi-Dawson 2013). The traditional technique is mostly used for subsistence purposes while the semi-mechanized and industrial oil palm fruit processing techniques are basically for economic purposes (Patrick *et al.*, 2013; Udoh and Essien 2015). The traditional and semi-mechanized techniques of oil palm processing are small scale in nature and consist of a chain of activities including bunch reception, heaping (storage), fruit loosening, boiling, digestion, oil separation and clarification (Afoakwa and Skyi-Dawson 2013). On the other hand, industrial oil palm fruit processing involved complex activities and is capital intensive as well as produces several derivatives.

In recent times, an agency such as the Nigerian institute for oil palm research (NIFOR); individuals and research institutes have developed technologies to reduce drudgery and improve the traditional manual techniques of oil palm fruit processing. Following this innovation and subsequent adoption, the majority of the traditional oil palm fruit processors have metamorphosed to semi-mechanized technique with a greater economic prospect. As posited by Afoakwa and Skyi-Dawson (2013), generally all semi-

mechanized oil palm fruit processing mills are small scale and make use of hydraulic press and hand spindle press with a few of them using the combined digester press. As noted by Patrick *et al.*, (2013), all oil palm fruit processing mills in Akwa Ibom State are semi-mechanized, operate in small scale with an installed capacity in the range of half a ton to 2.5 tons of fresh fruit per hour. This suggests that the level of mechanization of the oil palm mills in Nigeria and Akwa Ibom State, in particular, are still at the rudimentary stage, hence its optimum capacity utilization rate cannot be guaranteed.

Apart from the technological factors, the capacity utilization rate of oil palm mills in the State is affected by the availability of fresh oil palm fruits. The supply of the fresh oil palm fruits had suffered a major setback following an increase in urbanization leading to the partial or total destruction of many oil palm plantations in the State (Udoh and Essien 2015). The issues of pilfering and availability of cheap import alternatives to oil palm fruit derivatives and the lopsided policies of government on agriculture have likewise contributed to the destabilization and dismal performance of many agro based firms including the oil palm processing mills (Patrick *et al.*, 2013, Fadare *et al.*, 2014, Akpan *et al.*, 2017 and Akpan *et al.*, 2020). In addition, the uncertainties in the economic environment, insufficient labour due to increasing rural – urban migration and unpredictable demand pattern have collaboratively influenced the performance of the oil palm mills in the State (Adeniyi *et al.*, 2014; Adebo and Olowokere, 2015 and Akpan *et al.*, 2016). However, the recent research has shown that many agro-based processors have adopted survival strategies such as rationing of production, engaging in complementary jobs and advanced payment through contract arrangement among others to deal with the dwindling performance of the agro-processing businesses (Akpan, Uwemedimo and Ima-Abasi 2019).

The capacity utilization rate is a major index of performance of a firm and as noted by Akpan *et al*., (2011) and Akpan *et al.*, (2012), it shows the relationship between actual output and design capacity of a firm. Capacity utilization is the ability of a firm to utilize the available raw material relative to the size or the potential of the processing unit. Few studies in Nigeria have shown that many agro-based firms have challenges in capacity utilization (Adeel and Simon, 2006; Salimonu *et al.*, 2006 and Akpan *et al.*, 2011). As observed by Akpan *et al.*, (2013a), prices of raw materials are critical as far as fully utilizing the capacity of a firm is concerned. Also, Ukoha (2000) reported that loans and advances to manufacturing firms in Nigeria have a negative impact on the firms' capacity utilization rates. Similarly, Kim (2003) in South Korea reported that firms' capacity utilization rate was affected by the cost of energy, material price, a rental price of capital and firm's output. In the same vein, Adeel *et al.*, (2006) in Nigeria discovered that firm's capacity utilization rates were affected by the erratic power supply, variations in demand, insufficient capital and insufficient raw materials. Besides, Shailendra and Malhotra (2007) discovered that selected industries' capacity utilization rates in India were sensitive to input prices, demand and labour intensity. As well, Akpan *et al*., (2011) showed that increase in agro-based firm's output price and energy consumption have significant negative relationships with its technology-based capacity utilization rate while, the wage rate, cost of research and human capital have a significant positive influence. Likewise, Mojekwu and Iwuji (2012) found that power supply had a significant positive impact on the capacity utilization rate of firms in Nigeria. Again, Akpan *et al.*, (2013b) revealed that the physical capacity utilization rates of a sugar industry were influenced by the industry's labour productivity, income per capita worker and raw materials. Still, Akpan *et al.*, (2013a)

further showed that economic capacity utilization rates in the sugar industry in Nigeria were influenced by energy consumption. In Rwanda, Ndemezo *et al.*, (2018), showed that food processing industry capacity utilization was negatively determined by the shortage of raw materials, lack of specialized technology, tax administration and standards. Also, the driver of capacity utilization in the beverage manufacturing industry was firm years of experience.

From the literature presented, it is obvious that capacity utilization rates as an indicator of firm's performance had not been explored judiciously especially in micro agro-based firms in Nigeria and Akwa Ibom State in particular (Adeel and Simon, 2006 and Akpan *et al.,* 2013a). Most of the literature on the capacity utilization rate in Nigeria and elsewhere are derived from the industry at the national level without due and specific consideration of the micro firms who faced diverse production risks and uncertainties. Increment in the total production is generally linked to an increase in the capacity utilization rate of a firm. Hence, an increase in capacity utilization of a firm increases the tendency of the firm's competitiveness, profitability; reduce import dependency, improved innovation adoption, increase efficiency in resource use and ensure the sustainability of firms. Despite these advantages of an increase in capacity utilization rates, the majority of agro-processing mills in Akwa Ibom State have continued to produce below the installed or potential capacity (Akpan *et al.,* 2016). In the oil palm sub-sector, the frequent shortages of crude oil palm and price hike in oil palm fruit derivatives as well as the continuous upsurge in poverty and income inequality of oil palm farmers and processors in the State are clear shreds of evidence of the deteriorating performance of the oil palm sub-sector and perhaps its capacity utilization rates (Patrick *et al.,* 2013).

Owing to the overwhelming importance of the need of a firm to maintain a healthy capacity utilization rate; the research specifically aimed to determine the capacity utilization rates of the oil palm fruit processing mills and determine factors that influence it in Ikot Ekpene agricultural zone of Akwa Ibom State.

RESEARCH METHODOLOGY

Study Area

The study was conducted in Ikot Ekpene agricultural zone, Akwa Ibom State, Nigeria. Akwa Ibom State has six (6) agricultural zones namely: Uyo, Oron, Ikot Ekpene, Eket, Abak and Etinan. Ikot Ekpene agricultural zone consists of five (5) local government areas, which are: Ikot Ekpene, Obot Akara, Essien Udim, Ikono, and Ini. The headquarter of the zone is at Ikot Ekpene local government area and is situated at latitude 5.18° north and longitude 7.71° east. The zone has a humid tropical climate, characterized by distinct wet and dry seasons. Annual rainfall varies from 20 mm to 374 mm with an annual average of 354 mm. The average annual temperature varies from 25.10 degree Celsius to 27.9 degree Celsius. Besides, the relative humidity remains at an average of 70 – 80 percent throughout the year. The average sunshine revolves around 1,450 hours per year and the annual evaporation rate range from 1,500 – 1800 mm (Ekpeyong, 2013). The target population of this study comprises of all the small scale oil palm fruit processing mills in Ikot Ekpene Agricultural zone of Akwa Ibom State. From the records of Akwa Ibom State Agricultural Development Programme, 2018, there are about one hundred (100) oil palm processing mills in Ikot Ekpene agricultural zone.

Type of Data, Sampling Procedure and Sample Size

Primary and secondary data were collected from the oil palm mill owners in the study area. For the primary data, a structured questionnaire was designed and

administered to the oil palm processors to collect the required information. A three-stage sampling method was used in the study. The first stage was the purposive selection of three local government areas in the zone noted for intensive production and processing of oil palm fruits. The local government areas selected were; Ikot Ekpene, Obot Akara and Essien Udim. The second stage involved the random selection of twenty (20) villages that have at least one oil palm mill from each of the three local government areas selected. A total of sixty villages were selected for data collection. The last stage was the selection of one oil palm mill from each of the village selected. The criteria for selecting oil palm mill were based on the years of experience, consistency and the size of the operation. A total of sixty (60) oil palm processing mills were selected in the zone for the study.

Estimation of the Capacity utilization Index of the oil palm processing mill

The capacity utilization rate of the processing mill was estimated using the relationship between the potential output (installed capacity of a mill) and the actual output (quantity of crude palm oil produced). From Akpan *et al.*, (2011), the capacity utilization rate is defined as:

$$CPU = \frac{Actual\ output\ \ produced\ by\ the\ processing\ unit\ \ (tons)}{Install\ Capacity\ of\ the\ processing\ unit\ (tons)} X100 \ldots (2)$$

Where 'CPU' represents the capacity utilization index of the oil palm processing mill expressed in percentage. The value of the CPU lies from 0 to 100. A CPU value closer to 100 percent implies high capacity utilization, while value farther from 100 percent and closer to zero implies low capacity utilization. The index was estimated for each of the oil palm processing mills. Note, the actual output of a processing mill was computed for a year while the installed or potential capacity was a year rating al in tons.

Factors influencing the capacity utilization of the oil palm processing mill

This objective was analyzed using the multiple regression analysis, which involved factoring some socioeconomic data of the oil palm processors as shown below:

$$CPU = \delta_0 + \delta_1 AGE + \delta_2 EDU + \delta_3 EXP + \delta_4 QTR + \delta_5 FUL + \delta_6 LON + \delta_7 LAB + \delta_8 TAX + \delta_9 HHS + \delta_{10} MAC + e_i \ldots\ldots\ldots\ldots\ldots\ldots\ldots (3)$$

Where,

CPU = Capacity utilization rate of a processing mill as defined in equation 2

AGE = Age of a processor (year)

EDU = Education of a processor (year)

EXP = processing experience (years)

QTR = Quantity of raw material (fresh oil palm fruit) processed in a year (Kg)

FUL = Amount of fuel bought in a year (Naira)

LON = Loan acquired (Naira)

LAB = Amount paid for labour (Naira)

TAX = Amount paid as tax computed for a year (Naira)

HHS = Household size of a processor (number)

MAC = The initial cost of machines and tools in the mill as a measure of the level of mechanization of the mill (Naira)

The estimation of the model was based on the ordinary least squares estimation method.

RESULTS

Capacity Utilization Rate of Oil Palm Processing Mills

The distribution of the estimated capacity utilization indices across the oil palm processing mills is shown in figure 1. The

estimated indices revealed the mean capacity utilization index of 53.04% across the processing mills. This means that the oil palm processing mills in the zone have unused capacity utilization rate gap of 46.96% relative to its potential capacity. From the distribution of the indices of the capacity utilization, the most efficient oil palm fruit processing mill obtained a capacity utilization index of 88.89% and the least efficient mill operates on a capacity utilization index of 8.33%. The breakdown of the capacity utilization distribution of the oil palm processing mill revealed that about 1.67% of the processing mills obtained a capacity utilization index that is less than 10.00%. Only 6.67% and 13.33% of the oil palm fruit processing mills operated in the capacity utilization rates that range from 10.00 – 20.00% and 20.01 – 40.00% respectively.

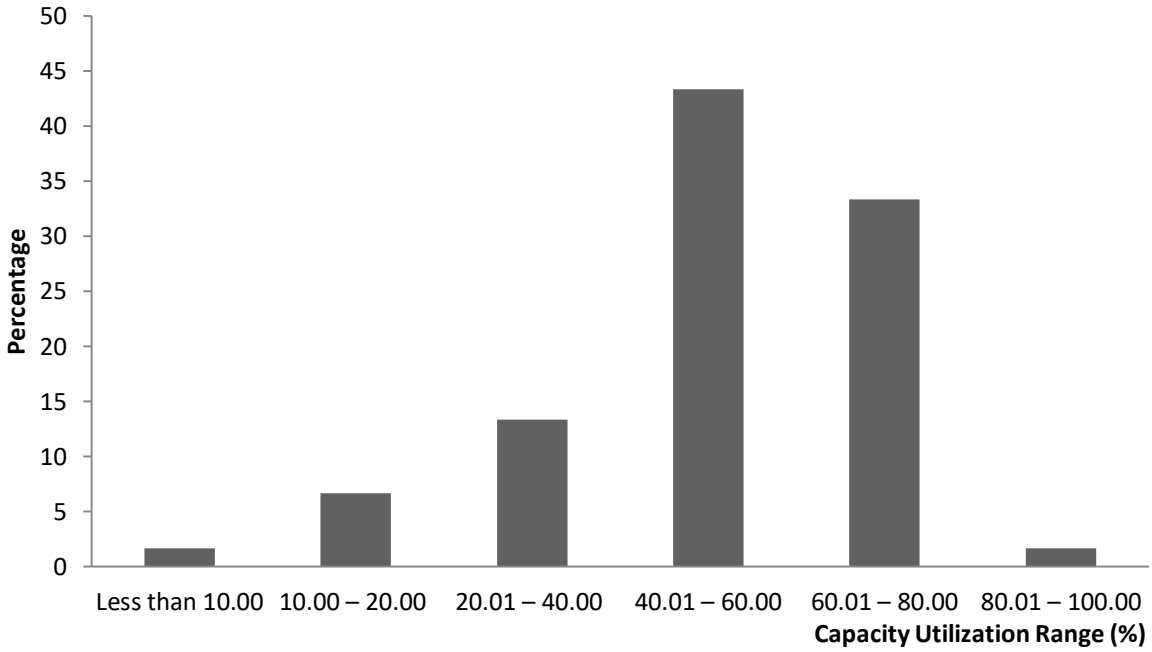

Fig. 1: Capacity Utilization of oil Palm Processing Mills in Ikot Ekpene Agricultural Zone

Also, 43.33% and 33.33% of the processing mills operated in the capacity range from 40.01 – 60.00% and 60.01 - 80.01% respectively. However, only 1.67% of the oil palm processing mills in the zone operated in the capacity utilization range of 80.01 to 100.00%.

The distribution of the capacity utilization rates among the mills suggests that the oil palm processing business has unresolved fundamental issues that prevented them from operating on maximum capacity. For instance, the issue of the seasonality of oil palm fruits production is critical. During the off-season period, the number of bunches produced diminishes thereby preventing the processors from utilizing fully the installed capacity of the processing unit. The mischievous activities (i.e. the illegal purchased through unauthorized markets and routes and predatory contract arrangement with the local farmers) of the rich merchants from the neighbouring states have also contributed to the inability of the oil palm processors to meet their full installed capacity. Worth mentioning also is the issue of poor maintenance of the few machines and tools used in the processing business.

Factors Influencing the Capacity Utilization of Oil Palm Fruit Processing Mills

The factors influencing the capacity utilization of the oil palm processing mills

were estimated and are presented in Table 1. The diagnostic statistics revealed the coefficient of multiple determinants (R^2) value of 0.6641, implying that about 66% of the variations in the capacity utilization index of the oil palm processing mills are attributed to the specified explanatory variables.

Table 1: Determinants of Capacity utilization among oil palm processing mills

Variable	Coefficient	Standard error	t- value	Probability
Constant	47.34	16.14	2.9331***	0.0051
Age	−0.2138	0.2277	−0.9390	0.3525
Education	0.308	0.0859	3.5856***	0.0008
Processing experience	0.0116	0.0039	2.9744***	0.0018
Qty of raw materials processed	0.0813	0.0221	3.6787***	0.0006
Labour cost	−0.0039	0.0011	−3.5455***	0.0009
Loan acquired	4.93E-05	2.74E-05	1.7993*	0.0779
Cost of fuel	−0.00803	0.00091	−8.8242***	0.0000
Tax paid	−0.00769	0.00176	−4.3693***	0.0000
Household size	−1.4841	1.1329	−1.3100	0.1963
Initial cost of Machine and tools	−2. 71E-05	1.42E-05	−1.9085*	0.0661
Diagnostic tests				
R-squared	0.6641	Heteroskedasticity (white test)		25.7725***
F(10, 49)	17.2633***	Normality test		10.2466***
Log-likelihood	−251.0241	RESET test F (2, 47)		13.5216***

Sources: data from field survey, 2019, *significant at 10% ** significant at 5% *** significant at 1% probability level.

The F-cal of 17.26 is significant at the 1% level of probability, implying that the estimated R^2 is significant and by implication, the estimated model has the goodness of fit. The normality test revealed that the regression residuals are normally distributed and by implication justifies the used of the Ordinary Least Squares estimation method. The RESET test is also significant at 1.00% significance level, thus showing that the estimated model has structural rigidity and that the estimates are best, linear, unbiased and efficient.

The empirical result revealed that the estimated coefficient of education variable is positive and significant at 1% probability level. This means that the educational attainment of a processor has a significant positive effect on the capacity utilization rate of the oil palm fruit processing mills. By implication, an increase in years of formal education of the oil palm processors would result in an increase in the capacity utilization rate of the oil palm fruit processing mills. To be precise, a year increase in the formal education of the oil palm processor would lead to 0.308% increase in the capacity utilization rate of the oil palm fruit processing mill.

The estimated coefficients of the processors' year of experience and quantity of the raw materials used were positive and significant at 1% level of probability respectively. This implies that an increase in the processors' experience or quantity of raw materials used would increase the capacity utilization rate of the oil palm fruit processing mill correspondingly. The finding showed that one percent increase in the processors' experience or quantity of the raw materials used would lead to 0.0116% and 0.0813% increase in the capacity utilization rates of the oil palm fruit processing mill respectively.

The finding also showed that the coefficients of the startup cost of the machine used and tax paid by the processors were negative and significant at 10% and 1% level of probability

respectively. This connotes that increase in these variables would result in a decline in the capacity utilization rate of the oil palm fruit processing mill. In other words, the larger the startup cost of machine or tax paid by the processors; the lower the capacity utilization rates of the oil palm fruit processing mill. For instance, a unit increase in the tax paid would result in the reduction of the capacity utilization rate by about 0.008 units while a unit increases in the startup cost of the machine would reduce the capacity utilization rate marginally by 0.0000271 unit.

In addition, the coefficient of loan acquired by the processors was positive and significant at 10% level of probability. This means that increase in the amount of loan obtained by a processor would result in an increase in the capacity utilization rate of the oil palm fruit processing mills. Alternatively, an increase in the amount of loan acquired by the processors would correspondingly increase the capacity utilization rate of the oil palm fruit processing mill.

The result further revealed that the slope coefficients of the wage rate and the expenditure on fuel were negative and significant at 1% probability level respectively. The finding suggests that an increase in the wage rate or the expenditure on fuel would lead to a decline in the capacity utilization rates of the oil palm fruit processing mills. Precisely, a unit increase in the wage or fuel expenditure would lead to about 0.0039 units and 0.00803 units' reduction in the capacity utilization rate of the oil palm processing mill respectively.

DISCUSSION

The magnitude of the capacity utilization rate gap discovered among the processing mills suggests that the oil palm fruit processing mills in the zone are not able to adequately surmount the key constraints inherent in the oil palm fruit processing business in the zone. It means that on average an oil palm fruit processing mill has about 46.96% of un-utilized installed capacity. The finding revealed that about 50% of the oil palm fruit processing mills are operating below the 50% capacity utilization rate or are having about 50% unutilized capacity. This is a serious problem concerning the sustainability of the oil palm fruit processing business in the study area. Hence, the future or the sustainability of this sub-sector in Akwa Ibom State depends on identifying the fundamental factors that will turnaround or increase the capacity utilization rate of the oil palm fruit processing mills to an optimum level in the State.

The empirical analysis identified several factors affecting the capacity utilization rate of the oil palm fruit processing mills in the study area. One of the factors identified is the educational qualification of the oil palm processors. The more years of formal education acquired by the processor (owner of the mill), the higher the rate of the capacity utilization rate of the processing mills achieved. The relationship between the educational qualification of the processors and the capacity utilization rate of the processing mills satisfies *a priori* expectation as an increase in years of formal education has been shown by several studies (Fadare *et al.*, 2014 and Akpan *et al.*, 2020) to influence positively the level of innovation adoption and access to improved information, credit and market potentials. Increase in the years of formal education also increases access to improved human capital such as technical or on the job training, skills, health, and values such as punctuality which are critical in the management of firm's physical resources. A similar result has been reported in the sugar industry in Nigeria by Akpan *et al*., (2011).

Another important factor identified that affect capacity utilization rate of oil palm fruit processing mill is the operational taxes

levied on the oil palm processors in the State. As the tax paid by the owner of the mill increases, the capacity utilization rate shrinks accordingly. The negative effect of tax on the capacity utilization rate of the mills implies that increase in tax paid by the processors is capable of increasing the cost of production, thereby constraining the processors from acquiring more essential factors of production. The finding corroborates the report submitted by Ndemezo *et al.,* (2018).

The established relationship between the quantity of raw material (fresh oil palm fruit) used and capacity utilization rate of the mills is in line with *a priori* expectation. As expected, an increase in the quantity of fresh oil palm fruit processed by a mill would lead to a corresponding increase in the capacity utilization rate of the mill. This relationship suggests that the oil palm processing mills in the study area have the prerequisite potential capacity to process the quantity of fresh oil palm fruits supplied to it. Based on the capacity utilization gap discovered among the oil palm processing mills in the State, it implies that the oil palm processing mills in Akwa Ibom State are not potential capacity-constrained but are input (fresh oil palm fruit) constrained. By implication, the capacity utilization rate of the oil palm processing mills would increase if the quantity of fresh oil palm fruits supplied to the mills is increased. The finding implied the importance of the availability of raw materials (i.e. the fresh oil palm fruits) in the attainment of full or improved capacity utilization rate in oil palm processing mills. Kim (2003) and Adeel and Simon (2006) have submitted similar reports, while Ndemezo *et al.,* (2018) reported a contrary finding.

Likewise, the positive relationship between the processors' experience and capacity utilization rate of the mills revealed the importance of persistency in agro-based production. As the processors years of experience increase; the ability to adapt the best technique of production that minimizes risk and promotes efficient use of resources over time would also increase. Capacity utilization rates would increase due to the adaptive behaviour of the processors mostly determined by the size of the processing experience. This means that processors with more experience would likely have increase capacity utilization rates compared to those with fewer years of experience. The finding aligns with the empirical report of Ndemezo *et al.,* (2018). On the other hand, the negative correlation between the initial cost of machines/tools and capacity utilization rate of the oil palm processing mill suggests that many of the processing mills are still using the traditional and manual techniques of production. For instance, an increase in the cost of machines/tools would prevent the resource-poor processors from acquiring the basic machines/tools needed for efficient management of production processes. Increase in the cost of machines/tools would lower the ability of most processors to mechanize the operations of the oil palm processing, thereby resorting to the traditional technique of production often characterized by low capacity utilization rate.

The established relationship between credit demand and capacity utilization rate of the oil palm fruit processing mills means that, as credit demand increases, the capacity utilization of the mills also increases. The association between the two variables suggests that increase access to credit is capable of facilitating the acquisition and efficient management of the physical firm resources, which could lead to an increase in output and capacity utilization correspondingly. However, in Nigeria, Ukoha (2000) has rather submitted a negative relationship between loan and capacity utilization in the manufacturing sector in Nigeria.

The wage rate has a significant negative effect on the capacity utilization rate of the oil palm processing mills in the study area.

This means that, as the processors spent more money on the wage rate, the capacity utilization rates of the mills deteriorate. The finding implies that the wage rate paid by the processors is high and this is an indication that labour is not readily abundant in the study area. The increase in the rural-urban migration of the youth population and the drudgery involved in oil palm processing could be responsible for this relationship. A high wage rate would likely lead to an increase in the production cost which is capable of constraining the use of factors of production by the processors. The resultant effect would be the reduction in the capacity utilization of the processing plant. The finding is in agreement with the report of Shailendra and Malhotra (2007), but is contrary to the finding of Akpan *et al*., (2011).

The study also found negative impact of the expenditure on fuel on the capacity utilization of the oil palm fruit processing mills. By implication, the expenditure on fuel has a significant negative effect on the production cost. A higher production cost tends to lower the firm's total output and total revenue leading to low farm investment and consequently lower capacity utilization rate. The result is similar to the submission of Kim (2003), Adeel and Simon (2006) and Akpan *et al*., (2011). However, the finding contradicts the reports of Mojekwu and Iwuji (2012) and Akpan *et al.*, (2013a) for other agro-based industries in Nigeria.

CONCLUSION

The Oil palm fruit processing mills in the study area have not achieved their best outputs when compared to their installed capacities. The evidence is obvious given the average capacity utilization gap of 46.96% discovered among the processing mills. The study has generated policy variables that are prerequisites for attaining the full capacity utilization rate in the oil palm fruit processing mills in the State. Such policy variables include improved human capital; enhance credit accessibility and affordable sources of energy among others.

RECOMMENDATIONS

Based on the findings, the following recommendations would be appropriate to upsurge the capacity utilization rate of the oil palm fruit processing mills in the zone.

1. Improved quality of education of oil palm processors would help to increase their capacity utilization rates. This could be achieved by initiating regular training with a special curriculum that focuses on the development of new techniques of oil palm processing.
2. Making oil palm fruit available to processors at the affordable market price is a key to attain the full capacity utilization rate in the oil palm fruit processing mills in the State. This could be achieved by abolishing the contractual arrangement farmers have with rich merchants. Also, the State should set up a well-coordinated central market for buying and selling of oil palm products in Ikot Ekpene Agricultural Zone.
3. Youths should be encouraged into oil palm processing business as a way to reduce labour cost while credit, tax holiday and constant and affordable sources of energy should be provided for the oil palm processing mills in the State.
4. Encouraging appropriate family planning method for processors would help to reduce family size, family expenditure and hopefully increase farm investment that will result to increase in outputs and capacity utilization rate.

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