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PROCESSORS' PERCEPTION OF IMPROVED COCONUT PROCESSING TECHNOLOGIES IN LAGOS STATE, NIGERIA

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ABSTRACT

The study was carried out in Lagos State to investigate processors' perception of improved coconut processing technologies. Structured, pretested and validated questionnaire was used to collect data from 120 respondents selected in Lagos State through multi-stage sampling techniques. Data obtained were analysed using descriptive and inferential statistics. The study revealed that majority (77.1%), of the respondents fall between the ages of 41 - 60 years, female (53.4%) and married (88.1%). Also, majority of the respondents (67.8%) had primary with or without secondary education and larger percentage had up to 15 years of processing experience (70.3%). Sun drying copra (100%), use of coconut woods and husks to produce heat for drying copra (100%), hand grater and clean piece of white cloth for aqueous processing (100%), large mortar and pestle for pulverizing coconut meat (100%) and bamboo screen for picking out foreign matters and dirt (86%) were the common coconut processing techniques available to respondents. Majority (90.7%), (88.1%), (83%), (67.8%) and (60.2%) of the respondents were not aware of carefully controlled moisture, waste heat recovery technology, hammer/roller mills, kiln dryer and rotary copra dryer respectively. However, most of the respondents (59.3%) had favourable perception towards improved coconut processing technologies. Chi-square result showed that marital status ($\chi 2 = 7.851$, $p = 0.049$), educational level ($\chi 2 = 27.722$, $p = 0.000$), and years of processing experience ($\chi 2 = 36.891$, $p = 0.000$) were significantly related to perception of improved coconut processing technologies. Similarly, Pearson Product Moment Correlation result also shows that age ($r = -0.320$, $p = 0.000$) was significantly related to perception of improved coconut processing technologies. It can be concluded that the respondents were not aware of improved coconut processing technologies. Therefore, the study recommends that effort should be intensified through extension by creating awareness and conducting training activities on the use of improved coconut processing technologies.

Keywords: processors, perception, coconut, technologies, awareness

INTRODUCTION

Nigeria, according to Oni (2008), has a land area of 98.3 million hectares and out of this, 74 million hectares and good for agricultural production, but less than half of this arable land is being exploited. The large hectarage of land under cultivation host a wide array of crops that have high potentials for generating revenue in their fresh or processed forms. The crops are seasonal and there is the need to carry out processing and preservation interventions that would ensure their availability throughout the year. Agro-processing therefore, should be accorded recognition, as it is not only important for the expansion and diversification of the agricultural sector, but also, as veritable tool for food security, poverty reduction and sustainable transformation of the Nigeria

rural community (Iwala, 2009). Lambert (2002) also noted that vibrant agro-processing activities can expand the markets for primary agricultural products, add value by vertically integrating primary production and food processing systems and minimize post-harvest losses. In addition, such activities would reduce seasonality of consumption of a range of perishable crops, and increase the viability, profitability and sustainability of production systems. This is expected to impact positively on farm incomes, rural employment and foreign exchange earnings, while reducing marketing risks (Oni, 2008). However, with few exceptions, the agro-processing sector remains rudimentary, underdeveloped and largely without significant institutional, technical and financial support.

The coconut palm (*Cocos nucifera*) is a monocotyledon belonging to a member of the family Arecaceae (Ohler, 1984), grows throughout the tropics and is widely called the "tree of life" for its important role in smallholders' livelihoods as a direct source of cash income, nutrition and materials (Warner, 2007). The economic importance of coconut extend from food to non-food, from industrial to household products. Its main product is the oil extracted from the kernel.

Coconut harvesting and primary processing is dominated by smallholders. As large coconut estates become more profitable, coconut harvesting and processing would be done in a large scale. The coconut can be processed into its various products either by traditional techniques or improved technologies. Some of the traditional techniques available to processors as noted by NIFOR (2009) and Foale (2003) include sun drying copra, coconut woods and husks to produce heat for drying copra, hand grater and a clean piece of white cloth for aqueous processing, large mortar and pestle for pulverizing coconut meat, bamboo screen for picking out matters and dirt and pith or drum for charcoal production. Also, according to DFID (2011) and NIFOR (2005) some of the modern or improved technologies developed to enhance coconut processing include waste heat recovery technology, hammer/roller mills, hydraulic press, carefully controlled moisture, kiln drying, mechanical dehusker, rotary copra and coconut oil expeller. However, copra is one of the most valuable economic products of processed coconut (Ohler, 1984).

The Federal Government of Nigeria, realizing that there is a great potential for coconut palm in the country, particularly in the area of generating employment, increasing food production and farmers' income, and for providing other sources of foreign exchange, added coconut palm as one of the mandate crops of Nigerian Institute for Oil Palm Research (NIFOR) in 1964. Consequently, some improved coconut processing technologies such as mechanical dehusker, coconut oil expeller and rotary copra dryer have been developed by NIFOR and disseminated to the processors over the years. Therefore, the aim of this study was to investigate processors' perception of improved coconut processing technologies in the study area. Specifically, the study sought to examine the selected personal characteristics of the respondents, identify the processing technologies available to the respondents, determine the respondents' awareness of improved coconut processing technologies and determine the perception of coconut processors on improved coconut processing technologies.

Hypothesis

The hypothesis stated in this study would be tested in the null form:
There is no significant relationship between the selected personal characteristics and perception of improved coconut processing technologies.

METHODOLOGY

The study was carried out in Lagos , South-west Nigeria. It lies between latitude $6^{o}2^{1}$N to $6^{0}4^{1}$N and longitude $2^{0}45^{1}$E to $4^{0}20^{1}$E, respectively and covers a total landmass of 358, 861 hectares or 3,577 sq km. The target population of the study was coconut processors. Multi-stage sampling techniques were used for selecting the sample from the population. Badagry Local Government Area was purposively selected for this study because of the high concentration of coconut production and processing activities. The LGA was stratified into three Local Council Development Areas ($LCDA_S$) namely: Badagry Central, Badagry West and Olorunda. Five communities were randomly selected from each of the LCDAs, making a total of 15 communities. From each community, 8 respondents who were coconut processors were purposively selected giving sample size of 120 respondents. Data collection was done through questionnaire. Of the one hundred and twenty questionnaires completed, one hundred and eighteen (118) were found useful for the analyses. Frequency count, means and percentages, Chi-square ($\chi 2$) and Pearson Product Moment Correlation (PPMC) tests were used to determine the significance of relationships between selected variables.

RESULTS AND DISCUSSION

Selected personal characteristics of respondents

Table 1 shows the selected personal characteristics of respondents.

Age of respondents: Result on age in Table 1 show that 5.1% of the respondents were young (21 - 30 years) while 3.4% were between 61 – 70 years. Larger proportions (77.1%) of them were between 41 – 60 years. The mean age of the respondents was 47.77

Table 1: Distribution of respondents according to selected personal characteristics (n=118)

Variable	Frequency	Percentage	Mean	Standard Deviation
Age				
21 – 30	6	5.1	47.77	9.46
31 – 40	17	14.4		
41 – 50	44	37.3		
51 – 60	47	39.8		
61 – 70	4	3.4		
Sex				
Male	55	46.6		
Female	63	53.4		
Marital status				
Single	8	6.8		
Married	104	88.1		
Divorced	3	2.5		
Widowed	3	2.5		
Educational level				
No formal education	35	29.7		
Primary	56	47.5		
Secondary	24	20.3		
Tertiary	3	2.5		
Years of processing experience				
1 – 5 years	7	5.9		
6 – 10 years	32	27.1		
11 – 15 years	51	43.2		
Above 15 years	28	23.7		

Source: Field Survey, 2012

years, with a standard deviation of 9.46 years. This result indicates that the larger percentage of the respondents were above 40 years, showing that many of them were getting old. This result agrees with the view of Farinde *et al*. (2007) that older generation were now left to farm while most of the young able-bodied men and women migrated to the urban centres in search of better life. The implication of this is that Nigeria will continue to depend on importation of coconut products from coconut producing countries like India except efforts are made by the Federal Government of Nigeria to revamp the processing sector of the coconut industry.

Sex of respondents: Females representing (53.4%) were more involved in coconut processing as shown in Table 1. This finding is in line with the general belief that women are expected to be economically independent through the sale of processed agricultural products and other activities such as weaving and fishing, etc. (Ekong, 2003). Another reason could be that the culture of the people in the area does not allow females to own coconut farm (Taiwo, 2010).

Marital status of respondents: The result in Table 1 shows that 6.8% and 88.1% of the respondents indicated that they were single and married respectively while 2.5% were divorced and widowed. The high percentage of married among respondents corroborates the observation of Tologbonse and Adekunle (2000) that 98.5% of the rural farmers in Benue State were married. Marriage was also perceived as facilitating household farming and processing activities (Ekong, 2003).

Educational level of respondents: Respondents' level of education is an important factor that brings about desirable changes in processors' skill and awareness and enhances processors' perception of improved coconut processing technologies. The educational attainment of a farmer does not only raise his productivity but also increases his ability to understand and evaluate the information on new techniques and processes being disseminated through (Ani *et al*., 2009). The result in Table 1 reveals that majority of the respondents (67.8%) had primary and secondary education. This result agrees with Abiodun *et al*. (2011) that majority of respondents in urban South-west Nigeria had primary and secondary education. Proper education according to Ochu (2000) is important in the use of improved farm practices.

Years of processing experience of respondents: The result in Table 1 also reveals that majority (70.3%) of the respondents had more years of processing experience (6 – 15 years). Since majority of the processors sampled have between 6 – 15 years of processing experience, it gives an indication of the practical skill and knowledge the respondents must have acquired in the area.

Coconut processing techniques and technologies available to respondents

The most common coconut processing techniques available to respondents were the traditional techniques which were sun drying copra (100%), use of coconut woods and husks to produce heat for drying copra (100%), hand grater and clean piece of white cloth for aqueous processing (100%), large mortar and pestle for pulverizing coconut meat (100%) and bamboo screen for picking out foreign matters and dirt (86%) as shown in Table 2. This corroborates the position of NIFOR (2008) that traditional coconut processing techniques are more prevalent in the coconut producing areas of Nigeria. However, mechanical dehusker 6.8%, coconut oil expeller and hydraulic press 3.4% were the common improved technologies available to the processors.

Awareness of improved coconut processing technologies

The result in Table 3 indicates that majority of the respondents were not aware of the following improved coconut processing technologies such as carefully controlled moisture (90.7%), waste heat recovery technology (88.1%), hammer/roller mills (83%), kiln dryer (67.8%) and rotary copra dryer (60.2%). However about 91.5% and 58.5% of the respondents were aware of some improved coconut processing technologies such as mechanical dehusker and hydraulic press. This may be due to the fact that most of the respondents had primary with or without secondary school education.

Processors' perception of respondents towards improved coconut processing technologies

The views of the processors were assessed by asking the respondents to indicate their opinion on 26 positive and negative statements. Their responses were recorded on a five-point Likert scale of SA (Strongly Agreed), A (Agreed), U (Undecided), D (Disagreed), SD (Strongly Disagreed). Scores

Table 2: Distribution of respondents according to the availability of traditional coconut processing techniques and improved coconut processing technologies (n = 118)

Traditional coconut processing techniques	Available (%)	Not Available (%)
Sun drying copra	118 (100)	-
Use of Coconut woods and husks to produce heat for drying copra	118 (100)	-
Hand grater and clean piece of white cloth for aqueous processing	118 (100)	-
Pith or drum for charcoal production	40 (33.9)	78 (66.1)
Large mortar and pestle for pulverizing coconut meat	97 (82.2)	21 (17.8)
Bamboo screen for picking out foreign matters	101 (86)	17 (14)
Improved coconut processing technologies		
Mechanical dehusker	8 (6.8)	110 (93.2)
Rotary copra dryer	2 (1.7)	116 (98.3)
Coconut oil expeller	4 (3.4)	114 (96.6)
Kiln dryer	3 (2.5)	115 (97.5)
Waste heat recovery technology	2 (1.7)	116 (98.3)
Hammer/rollers mills	2 (1.7)	116 (98.3)
Hydraulic press	4 (3.4)	114 (96.6)
Carefully controlled moisture	3 (2.5)	115 (97.5)

Source: Field Survey, 2012

Table 3: Frequency distribution of respondents on improved coconut processing (n = 118)

Improved Coconut Processing Technologies	Aware (%)	Not Aware (%)
Mechanical dehusker	108 (91.5)	10 (8.5)
Rota ry copra dryer	47 (39.8)	71 (60.2)
Coconut oil expeller	56 (47.5)	62 (52.5)
Kiln dryer	38 (32.2)	80 (67.8)
Waste heat recovery technology	14 (11.9)	104 (88.1)
Hammer/roller mills	20 (17)	98 (83)
Hydraulic press	69 (58.5)	49 (41.5)
Carefully controlled moisture	11 (9.3)	107 (90.7)

Source: Field Survey, 2012

of 5, 4, 3, 2, and 1, respectively, were assigned for positive statements while 1, 2, 3, 4, and 5, respectively, for negative statements. Respondents with score less than mean were categorised as having unfavourable perception about improved coconut processing technologies, while those who scored above mean were categorised as processors' who have a favourable perception of improved coconut processing technologies. Large proportion (59.3%) of the respondents as revealed in Table 4 had favourable perception towards improved coconut processing technologies with perception mean of 109.72 and a standard deviation of 4.30 while about 40.7% of the respondents had unfavourable perception towards improved coconut processing technologies. It could be inferred from the result that more than half of the respondents had a positive perception of improved coconut processing technologies which implies that they are willing to adopt the improved technologies if they are affordable and available.

Table 5 shows that there was a significant relationship between age of respondents and perception of improved coconut processing technologies (r = -0.320, P≤0.05). Age was negatively significant which implied that as the age of the respondent's increased their perception on improved coconut processing technologies decreased. This finding is in line with that of Gul Unal (2008) who found that old age might pose disadvantages in agriculture because most of the work is physically demanding and also because older household heads might be too conservative to try new and more efficient

Table 4: Distribution of respondents' perception of improved coconut processing technologies

Perception of improved coconut processing technology	Frequency	Percentage	Minimum	Maximum	Mean	Std. Deviation
Unfavourable	48	40.7	88.00	119.00	109.72	4.30
Favourable	70	59.3				
Total	118	100				

Source: Field Survey; 2012

Table 5: PPMC relationship between age and perception of improved coconut processing technologies

Variable	r-value	p-value	Remark	Decision
Age	-0.320	0.000	Significant	Reject Ho

r = correlation coefficient, p = probability level of significance p ≤ 0.05 (Significant)
Source: Field Survey, 2012

Table 6: Chi-square analysis of the sex, marital status, educational level, and years of processing experience and perception of improved coconut processing technologies

Variables	$\chi 2$	df	P-value	Decision (P≤0.05)
Sex	$\chi 2$ = 0.264	1	0.606	Not significant
Marital status	$\chi 2$ = 7.851	3	0.049	Significant
Educational level	$\chi 2$ = 27.722	3	0.000	Significant
Years of processing experience	$\chi 2$ = 36.891	3	0.000	Significant

$\chi 2$ = Chi-square, df = Degree of freedom, p = probability level of significance p≤0.05 (Significant)
Source: Field Survey, 2012

techniques. This finding also contradicts that of Ogunsade (2011) that there is no significant relationship between age and farmers' perception of an innovation.

Chi-square result in Table 6 shows that educational level of the respondents' was positively related to their perception of improved coconut processing technologies (($\chi 2$ = 27.722, p = 0.000). This implies that enhanced education could have positive influence on the respondent's perception of improved coconut processing technologies.

Similarly, Table 6 shows that there is a significant positive relationship between respondents' marital status and their perception of improved coconut processing technologies ($\chi 2$ = 7.851, p = 0.049). It implies that married processors favoured perception of improved coconut processing technologies hence facilitating the utilization of improved technologies that enhance the processors' productivity. In the rural setting according to Oyesola (2011), the initial efforts of a household towards ensuring household food security essentially involved crop production and processing. In this situation, processors should be encouraged to use improved technologies. In the same vein, as shown in Table 6, years of processing experience ($\chi 2$ = 36.891, p = 0.000) was also significantly related to their perception of improved coconut processing technologies. This implies that the more experienced a respondent is the more efficient his perception towards improved coconut processing technologies and the more he will be willing to take risks associated with the adoption of improved technologies. This result agrees with those of Onyenweaku and Effiong (2005). However, Table 6 also reveals that there is no significant relationship between sex ($\chi 2$ = 0.264, p = 0.606) and respondents' perception of improved coconut processing technologies. This is an indication that the perception of the males is not better than that of their female counterparts. This result also agrees with those of Oyesola and Adegboye (2011).

CONCLUSION

Based on the empirical findings of this study, it can be concluded that the respondents were mostly females, married, had primary and secondary education, and were of older generation. The study also shows that majority of the respondents had processing experience of 15 years. The major processing techniques available to the respondents were: sun drying copra (100%), use of coconut woods and husks to produce heat for drying copra (100%), hand grater and clean piece of white cloth for aqueous processing (100%), large mortar and pestle for pulverizing coconut meat (100%) and bamboo screen for picking out foreign matters and dirt (86%). A large number of the respondents were not aware of improved coconut processing technologies. Finally, more than half of the respondents had favourable attitude to improved coconut processing technologies.

RECOMMENDATIONS

Based on the findings of the study, the following recommendations are made:

There is need for the extension section of NIFOR, LASCODA, and ADP to work together on how to disseminate adequate information to coconut processors so as to create awareness on improved coconut processing technologies developed by NIFOR and other organizations through radio programmes aired at appropriate time and the use of leaflets produced both in English and local languages.

Adult literacy classes and training on improved coconut processing technologies should be organized for coconut processors by extension agents and other government agencies. This will go a long way in reducing

the level of illiteracy and increase the level of awareness, understanding, interest and involvement of processors in the use of improved coconut processing technologies.

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