CHOKOR SMOKER KILN TECHNOLOGY ADOPTION IN AKWA IBOM STATE: CONSTRAINTS AND PROSPECT

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Abstract

This study investigated the adoption level of Chorkor Smoker Kiln Technology (CSKT) , an improved fish processing technique ,among fish processors in rural communities of Akwa Ibom State. A multi - stage sampling technique was used to select respondents from each of the selected Agricultural Development Progammes (ADPs) Zones, and from the Zones, extension blocks were selected from the study area. Twelve extension cells were then randomly selected for the study. Twenty fish processors were randomly selected with the aid of Extension Agents working in each of the extension cells. Two hundred and forty randomly selected fish processors made up the sampling size for this study. The instrument (questionnaire) used in this study was validated and tested for reliability using test- retest method. Results indicated that 74.58% of the respondents were female while 25.42% were male. Majority of the respondents (32.50%) were within the age range of 40 - 49 years and followed by 50- 59 years (27.92%). About 14.17% of the respondents had no formal education while 32.92% and 39.58% had primary and secondary education, respectively. The highest household size was 4-6 persons and constitutes 41.25 % followed by 7-9 (33.33%) person per household. Most of the respondents had 21- 30 years experience (32.50%) and was followed by 30 - 40 years (25%) and 11 -20 years (21. 25%) experience. About 28 % of the respondents were unaware while about 71% were aware of the existence of CSKT. Out of the five CSKT packages, only one (double tray with mean adoption score of 0.178 out of a maximum of 6.0) was not widely adopted. Education level, household size and year of processing experience were positively related to adoption of CSKT adoption. CSKT adoption has prospect particularly if awareness creation is intensified and the identified constraints are sufficiently addressed.

Introduction

Nigeria has a vast expanse of inland fresh waters and marine ecosystems. The area is covered by water and is very rich in aquatic life especially fishes which are in high demand in the country. This is because fish constitutes a good source of vitamin A, D, phosphorus, calcium and iron (Owolabi, 2001). It also has a high content of polyunsaturated fatty acids which are important in lowering blood cholesterol level. National Development Plan (NDP) (2004) estimated that about 40% of animal protein consumed by Nigerians is obtained from fish and fishery resources.

However, fish is a highly perishable commodity and as such it is usually frozen or canned in order to prevent post harvest losses. In Nigeria, fish processors depend on traditional processing methods such as mud-type, drum-type, pit oven and sun light to reduce post harvest losses. These traditional methods of fish processing , however, do not effectively prevent microbial spoilage of harvested fishes (Tabor, 2000). Hence, post-harvest losses of harvested fish have not been effectively minimized by the use of these traditional methods of fish processing. The short comings of the traditional methods give rise to the introduction of an improved fish smoker Kiln called 'Chorkor Smoker ' by the United Nation Development Programme in 1997. Grassroots extension delivery was also carried out by the Agricultural Development Programme (ADPs) to disseminate this technology to fish processor (Jegede *et al*., 2002). More than a decade after the introduction of the improved fish processing technology among fish processors in Akwa Ibom State, there has been a dearth of information relating to the adoption or otherwise of the technology (Nkeme, 2007). This study therefore attempted to fill this gap as well as identify the constraints, if any, associated with adoption of this technology by fish processors in the study area. The specific objectives were to examine the socio-economic characteristics of fish processors in the study area, ascertain the level of adoption of the Chorkor smoker kiln technology, identity the constraints associated with its adoption by fish processors and assess the prospect of these technology in Akwa Ibom State.

Methodology

The study was carried out in Akwa Ibom State, Nigeria. The State is located in the Southeastern part of the country lying between latitude $4^o31'$ and $5^o31'$ North, and longitude $7^o35'$ and $8^o25'$ East. The state, which has 31 Local Government Areas and 7,245,935 sq. kms. land mass is bounded by Abia State in the north, Cross River State in the east , Rivers and Abia States in the West and in the South by the Bight of Bonny /Atlantic Ocean. It has estimated population of 3,920, 208 (NPC, 2006) and is occupied by people from Ibibio, Annang and Oron tribes. Purposive sampling method was used to select sampling population from Uyo, Eket and Oron Local Government Areas of the State for the study because fishing activities is the predominant occupation in these areas.

Before the select, preliminary field visits were made to identify fish processing locations that were surveyed, structured and interview schedule was used to obtain information from the respondents. The instrument (questionnaire) used in this study was validated and tested for reliability using test- retest method. Generally, the instrument assessed the level of awareness, adoption and constraints associated with adoption of Chorkor Smoker Kiln technology. A multi - stage sampling technique was used to select respondents from each of the selected ADPs Zones, and from the Zones, extension blocks were selected from the study area. Twelve (12) extension cells were then randomly selected for the study. Twenty (20) fish processors were randomly selected from the list of fish processors with the aid of Extension Agents working in each of the extension cells. On the whole, two hundred and forty (240) randomly selected fish processors made up the sampling size for the study. Frequencies and percentages were used to analyze the socio-economic characteristics of the fish processors (respondents) while the level of adoption of the packages was analyzed using the classical stages of adoption model. The constraints associated with adoption of Chorkor smoker kiln technology were determined using frequencies, percentages, means and ranking. In order to determine the factors influencing adoption of Chorkor Smoker Kiln technology (Y) was regressed on age (x_1), Educational level (x_2) Household size (x_3), frequency extension contact $(^1/_4)$ and years of experience (x_5).

Results and Discussion

Socio-Economic Characteristics

Table 1 shows the socio-economic characteristics of the respondents. The result indicated that 74.58% of the respondents were female while 25.42% were male. Majority of the respondents (32.50%) were within the age range of 40 and 49 years and followed by 50- 59 years (27.92%) and 30- 39 years (22.08%). Results showed that 14.17% of the respondents had no formal education while 32.92% and 39.58% had primary and secondary education, respectively. This implies a high level of literacy among the respondents as the majority of them had one form of formal education or the other. The highest household size was 4-6 persons and constitutes 41.25 % followed by 7-9 (33.33%) person per household. This implies that there is availability of family labour to support the different fish processing activities. Most of the respondents had 21- 30 years experience (32.50%) and was followed by 30 - 40 years (25%) and 11 -20 years (21. 25%) experience.

The level of awareness of the improved fish processing technology (Chorkor smoker kiln) by fish processors is presented in Table 2. About 28 % of the sampled fish processors indicated that they were unaware while about 71% indicated that they were aware of the existence of Chorkor Smoker Kiln technology. This finding implies a high prospect for this technology as the level of awareness of this innovation is quite appreciable. This finding is in consonance with that reported by Oluyide (2002) who noted that fish processors had high level of awareness of fish innovations.

The level of adoption of Chorkor Smoker Kiln technology is shown in Table 3. About 59% of the respondents adopted the technology while about 40% are yet to adopt the technology. This suggests a strong need to intensify awareness and education through method and result demonstrations. The distribution of respondents at different adoption level of Chorkor Smoker Kiln technology indicated that out of the five Chorkor smoker kiln technological packages, all the respondents (100%) adopted single trays and wooden trays (Table 4). The least adopted package of the technology was internal dimension with only 11.25% adoption.

The high level of adoption in the study area could be attributed to the required materials which are locally available and the level of the maintenance of the Chorkor Smoker Kiln which is a relatively low but cost effective, flexible and adoptable technology (Amalu, 1998). Out of the five Chorkor Smorkor Kiln technological packages listed only one (double tray with mean adoption score of 0.178 out of a maximum of 6.0) was not widely adopted. Stake hole of 38cm x

38cm, wooden trays of 0.8m x 0.8m x 0.7m, internal dimension of 0.7m x 0.7m x 0.7m and single tray were adopted by the respondents.

Table 1.Distribution of respondents according to personal and socio economic characteristics

Variable	Categories	Frequency	Percentage
Gender	Male	61	25.42
	Female	179	74.58
Age (years)	20-29	17	7.08
	30-39	53	22.08
	40-49	78	32.50
	50-59	67	27.92
	60 and above	25	10.42
Educational Level	No formal education	34	14.17
	Primary education	76	32.92
	Secondary	95	39.58
	Tertiary	32	13.33
Household size (No. of Person(s)		18	7.50
	4-6	99	41.25
	7 – 9	80	33.33
	>10	43	17-92
Years of experience	1 – 10	27	11.25
	11 – 20	51	21.25
	21 – 30	78	32.50
	30 – 40	60	25.00
	41 and above	24	10.00

Source: Field Survey (2006)

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Table 2.Distribution of respondents according to level of awareness of chorkor smoker kiln

Level of Awareness	Respondents	Percentage
Unaware	69	28.75
Aware	171	71.25
Total	240	100.00

Source: Field Survey, (2006).

Table 5 shows some factors impeding adoption of Chorkor Smoker Kiln technology in the study area. lack of money and incentive, transportation, , high cost of fish, cost of labour, inadequate monitoring, and lack of access to land are the major constraints to adoption of Chorkor Smoker Kiln technology.

Table 3.Distribution of respondents according to rate of adoption of the Chorkor Smorkor Kiln Technology

Level of Adoption	Respondents	Percentage (%)
Adoption	143	59.58
Non-Adoption	97	40.42
Total	240	100.00

Table 4.Distribution of respondents adoption level in Chorker Smoker Kiln technology packages

Adoption Level	Stoke hole	Double trays	Single trays	Wooden trays	Internal dimension
Not aware	39	53	-	-	25
Aware	13	45	-	-	105
Interested	25	30	-	-	13
Evaluation	22	25	-	-	3
Trial	3	16	-	-	97
Adoption	138	71	240	240	854
Total Adoption score	828	426	440	440	854
Mean adoption score	3.40	0.178	6.00	6.00	4.54

Grand Mean Adoption Score = 4.1

Table 5.Distribution of respondents according to constraints encountered

Constraints	Respondents	Percentage	Rank
Lack of money	77	32.08	1
Transportation	39	16.25	2
Lack of incentive	34	14.17	3
High cost of fish	29	12.08	4
Labour	22	9.17	5
Inadequate monitory	20	8.33	6
Land	19	7.92	7

Source: Field survey (2006)

Rank: The ranking is in order of importance. Rank 1 is considered major while it is considered minor.

The results of the linear functional form (Table 6) were selected as the best fit and also chosen for discussion because it has the highest significant variables, the highest magnitudes of co-efficient of multiple determination (R^2). The estimated regression equation revealed that the independent variables ($x_1 - x_4$) explained 34.5% of the variation in the adoption level (y), while

the remaining 65.5% was accounted for in the error term, which includes variables, which may have been left out, and other forms of errors outside the control of the researcher. The findings reveal that R^2 is positive and significant at the 5% level. Level of formal education was also found to be positively related to adoption of Chorkor Smoker Kiln. This shows that educated fish processors were more willing to adopt the technology than the less educated.

The co-efficient of household size is positive, suggesting that as the household size increased, adoption of Chorkor Kiln technology also increased. This is in consonance with a prior expectation. The relationship between processing experience and adoption of Chorkor Smoker Kiln was positive. This indicates that adoption increased as years of processing experience increased.

Table 6 Regression of factors influencing adoption of Chorkor Smoker Kiln Technology

Variables	Linear	Double-log	Semi-log
Constant	0.00 (5.257)	0.00 (8.384)	0.00 (28.518)
Gender	0.599 (0.527)	0.183 (-1.348)	0.686 (0.405)
Education	0.068 (-1.834)	0.225 (0.228)	0.074 (-1.800)
Household size	0.001 (3.319)	0.001 (3.522)	0.003 (3.036)
Frequency Extension	0.220 (-1.232)	0.247 (-1.171)	0.204 (-1.276)
Processing experience	0.000 (6.708)	0.398 (0.852)	0.000 (6.416)
R^2	0.345		
Adjusted R^2	0.306		
Statistics	8.889		

Coefficient significant at 1% level
Figures in parenthesis are standard errors of co-efficeints
** Coefficient significant at 10% level

Conclusions

The study revealed that level of education, household size and year of processing experience were positively related to adoption of Chorkor Smoker Kiln technology adoption. It is obvious that Chorkor Smoker Kiln technology adoption in Akwa Ibom State has prospect

particularly if awareness creation is intensified and the identified constraints are sufficiently addressed.

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