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Effectiveness of the Transfer and Utilization of Odourless Cassava *Fufu* Flour Processing Technology among Rural Women in Abia State, Nigeria

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ABSTRACT
The study investigated the effectiveness of transfer and utilization of odourless cassava *fufu* flour processing technology among rural women in Abia, State, Nigeria. A purposive and multistage random sampling procedure was used to select a sample of 120 respondents across the State. Data were collected through interview schedule and focus group discussion. Descriptive and inferential statistics were used to realized and test data. Respondents had a mean age of 40 years, majority of the women farmers (84.4%) were aware of the technology. Results of the mean ($\bar{X}$ 2.87) of the respondents indicated that the transfer agents were not very effective in transferring the technology. On effectiveness of utilization, a pooled mean of $\bar{X}$ 3.0 indicated an effective utilization. Respondents' age, educational level, farm size, and out-put, were determinants of utilization of the odourless cassava *fufu* flour processing technology in Abia State. There was a significant relationship between farmers utilization and contact with transfer agencies at (R^2 0718, P <0.05). The study recommended more visitations by the transfer agencies to the respondents. Also, timely provision of technology module and regular training to beneficiaries in Abia, State in order to enhance the rate of utilization of the technology.

Keywords: Transfer, Odourless Cassava, Fufu and Utilization

INTRODUCTION

Cassava Fufu is the second major product consumed by households in South-east, Nigeria. It ranks next to garri in importance. It is a fermented wet paste made from cassava roots. Cassava Fufu is very rich in carbohydrate. Traditionally, it is produced in the wet form with moisture content of 40 -50 percent and with characteristic offensive odour. In order to increase its shelf life, quality and quantities supplied, odourless cassava fufu processing technology was developed by the National Root Crops Research Institute, Umudike some decades ago. Odourless cassava fufu is a white fermented carbohydrate food produced from cassava root, unlike the traditional fufu which is normally in wet form, and highly perishable. The fufu is presented in dried form, is odourless, inelastic and slightly sour having a low particle size and zero cyanide content (FIIRO,2016).

Odourless cassava fufu processing flour is one of the off-farm activities carried out by the rural women. It is, therefore, necessary to extend and device improved techniques capable of increasing the income-generating capability of rural women and enhancing acceptability of cassava value-added products and widening the market base.

Odourless Cassava fufu processing involves a combination of activities which are performed in stages. Such activities are: (i) Peeling; (ii) Fermenting by soaking in water, (iii)Removal of water, grating into mash, (iv) Putting the grated mash into a container, covering and leaving it for a day, dehydrating by pressing inside a clean bag, (v) Breaking the pressed mash into granules, (vi) Spreading thinly to dry on a clean surface preferably on a raised platform,(sun drying), (vii) When dry, grinding to fine powder and sifting, (viii) Packaging in an airtight container or food–grading polyethylene bag. The National Root Crops Research Institute (NRCRI), Umudike having promoted value addition and processing technology for odourless cassava *fufu* (Olatunji and Nwakor, 2015). It is expected that this technology would have been transferred from the research station to the end users (that is, the farmers) via the transfer agencies. The goal of achieving agricultural transformation would be a mirage if developed technologies remain in the research stations.

These researchers are however worried by the low supply recorded in demand of odourless cassava fufu in the region, In spite of the breakthroughs recorded by NRCRI in technology development; this odourless cassava fufu flour products is not available in the common markets and restaurants like garri and semovita. This study, therefore, sought to provide information on the effectiveness of transfer and utilization of odourless cassava fufu processing technology among rural women in Abia State, Nigeria;

i. ascertain the respondents' awareness of odourless cassava *fufu* flour processing technology transferred to them;
ii. examine the sources of information on odourless cassava *fufu* flour processing technology to the respondents
iii. ascertain the effectiveness of utilization of odourless cassava *fufu* flour processing technology;
iv. determine the factors influencing transfer of odourless cassava *fufu* flour processing technology.

It was hypothesized that the utilization of odourless cassava *fufu* processing technology was not influenced by the selected socio- economic characteristics of the women farmers.

METHODOLOGY

The study was carried out in Abia State, Nigeria, Abia State is one of the 36 States of the Federal Republic of Nigeria. Its capital is Umuahia. Abia State is situated in the South-Eastern part on Nigeria and predominatly populated by the Igbos. The State is made up of 17 Local Government Areas. These LGAs are grouped into three agricultural zones, namely, Aba, Ohafia and Umuahia. The major farm crop grown include; cassava, yam, maize, melon, plaintain, banana, oil palm, etc and has vast areas of rich arable land (Nwankwo, *et al.,* 2017). The population of this study was made up of all the rural women involved in improving cassava processing technologies. In drawing the sample, purposive and multistage sampling technique were used. At the first stage, one agricultural zone was randomly selected. In the second stage, two blocks were randomly selected from the zones to give a total of six blocks. In the third stage, one cell was randomly selected from each of the blocks to give a total of 6 cells. In the fourth and final stage, twenty farmers were selected from each of the cells, giving a total of one hundred and twenty respondents. Interview schedule and focus group discussion were used to obtain primary data. Descriptive statistics, such as frequency, percentage and mean count and inferential statistics were used to realized and test data for the study.

RESULTS AND DISCUSSION

Awareness of odourless cassava fufu processing technology

The results on Table 1 show the distribution of respondents based on the awareness of cassava *fufu* processing technology. Majority of the women (66.7%), were aware of the odourless cassava *fufu*

processing technology, while 15.2% were not. This shows that the rural women farmers were sufficiently aware of all the components or processes involved in odourless cassava flour processing. This is a positive indication that the government, extension organisation and other transfer agencies were effective in utilizing the various communication channels available at their disposal to transmit message on odourless cassava *fufu* flour processing technology. The FGD findings confirmed this position. According to Ozoya (2008), and Akinnagbe and Ajayi (2010), awareness affects rural women's use of modern technology in farming.

Table 1 Distribution of respondents based on their Awareness of Odourless Cassava *Fufu* Processing Technology by Farmers

Awareness of odourless Fufu processing technology	Frequency	Percentage
Aware	80	66.7
Not aware	40	33.3
Total	120	100.0

Source: Field Survey, 2018

Source of Information on Odourless Cassava Fufu Technology

Table 2 indicates sources of information on odourless cassava *fufu* processing technology. Result shows that majority of the respondents received information about the technology from multiple sources, such as Cooperative society (85%), NGOs (68.3%). Also, other farmers turn out to be another source of information (50%), 60%, TV, bulletin and leaflets also act as good sources of information to the respondents. The concentration of development in these two sources of information is a necessary step towards a sustainable agricultural extension services in Nigeria. These findings are in tandem with the current trend of information channels that are used to disseminate agricultural technologies depending on the type of technology and the level of education of the farmers. Younger and better educated famers have more contact with information sources (Onumadu, 2002). This also confirms that farmer's information sources were significantly related to their awareness of odourless cassava fufu processing technology in the study area (Adeleye *et al*, 2016).

Table 2: Distribution of respondents based on source of information on odourless cassava *fufu* processing technology

Source of Information	**Frequency**	**Percentage**
Bulletin	39	85.0
ADPs	51	65.0
Radio	41	68.3
Newspaper	27	45.0
Other farmers	30	50.0
Cooperative society	56	93.3
TV	26	43.3
NGOs	66	93.3
Bulletin	39	85.0

Source: Field Survey, 2018. *Multiple responses recorded

Effectiveness of Utilization of Odourless Cassava Fufu Processing Technology

The result in Table 4 shows the level of effectiveness of utilization of odourless cassava *fufu* processing technology. The result revealed that there had been an increase in the processing of odourless cassava fufu compared with the base year, from the time the farmers became aware of the technology in the study area ($\bar{X}$ = 3.2). Also, the number of farmers utilizing the technology had mean$\bar{X}$= 3.3 implying that the number of farmers utilizing the technology was increasing. The implication of these results on usage and benefits enhanced the numbers of farmers who became interested in the technology.

On the indicator on increase of visitation by the transfer agencies we had.$\bar{X}$= 3.17. From the results, it can be said that there was a high level of effectiveness on the utilization of odourless cassava *fufu* technology based on the decision rule which States $\bar{X} \geq 3.0$ as effective utilization; $\bar{X} \leq 2.9$ indicates not effective.

Table 3: Effectiveness of Utilization of Odourless Cassava *Fufu* Processing Technology.

Level of effectiveness of Utilization	*f* x	$\bar{x}$	SD
Have there been increase in production of odourless fufu compared with the base year	192	3.29	1.3508
Have there been increase in the number of farmers utilizing the technology	197	3.30	0.9787
Have there been increase in visit by the transfer agencies	186	3.17	1.0506
Grand mean		**3.25**	
Sample size		***120***	

Source: Field Survey, 2018. Decision: $\bar{x} \geq 3.0$ indicates effective use; $\bar{x} \leq 2.9$ indicates not effective.

Factors Influencing Transfer of Odourless Cassava Fufu Processing Technology by Transfer Agencies

The majority posited that cost of the technology (82.5%) felt needs of women farmer, (80%) socio-economic characteristics of the farmer, (77.5%) literacy level of transfer agencies, (72.5), socio-cultural factors, (70%) greatly affected transfer of odourless cassava *fufu* technology in region. These result is in tandem with Agbarevo (2014) which stated that Extension delivery were not very effective in service delivery in Cross River State of Nigeria, The results from the reports of the FGD corroborate the findings given before from the primary data, the following factors to a great extent influenced the effective transfer of odourless cassava *fufu* processing technology by transfer agencies in the study area. The results implied that there was need to augment and minimize the negative effect of the factors.

Table 4: Factors Influencing Transfer of odourless Cassava *Fufu* Processing Technology by transfer Agents

Factors militating against transfer	Frequency	Percentage
Cost of technology	33	82.5
Literacy level of transfer agent	29	72.5
Complexity of technology	25	62.5
Socio-economic characteristics of the farmer	31	77.5
Timely provision of technology module	26	65.0
Cosmopolitness	27	67.5
Socio-cultural factors	28	70.0
Felt needs of the women farmer	32	80.0

Source: Field Survey, 2018

Table 5 showed the selected socio-economic factors influencing the women farmers utilization the technology. The result indicated that age, education, farm size and cassava output were the factors that were significantly related to the women farmers' utilization of the technology. Age was positive and significant at 5% level of probability. Table 5. also shows that education was positively related with the utilization The relationship was statistically significant at 5%. This result concurs with the finding of Adesope *et al* (2009) who opined that educational level of farmers could affect the rate of utilization of the technology. Sale *et al* (2016) suggested that as farmers education level improves, they are likely to utilize a technology. The coefficient of education had a positive effect on the economic activities on the rural women in study area. These findings supported the work of Akudugu *et al* (2012) who observed that the maximum level of education within the farm household was found to have a positive relationship with probability of adoption and is significant.

Farm size of the rural women was significantly related to the utilization of the technology by the respondents. Farm size was positively significant at 5% level of probability in Abia. The implication

of the results is that ownership of larger farm sizes affects farm decision and farm management skills. An experienced farmer with a large farm size is likely to easily identify the relative advantage of an innovation. This concurs with the submission of Babasanya *et al* (2013) that farm size and experience influenced the adoption of new cassava cultivaters and value addition technologies (Taniya, 2015).

The study shows that some selected socio-economic characteristics (age, education, farm size and output) were positive and significantly related to the utilization of the technology. This implied that farmers' socio-economic characteristics have a lot of bearing on their ability to partake and utilize a technology. The researchers, therefore, rejected the null hypothesis which states that there was no significant relationship between some selected socio-economic characteristics and the level of utilization of the technology and state that is a positive and significant relationship at 5% level of probability.

Table 5 Tobit Regression estimates of the influence of socio -economic characteristics of the women farmers on utilization of cassava odourless *fufu* processing technology in the study area

Variables	Abia
Constant	1.9153(5.76**)
Marital status	0.0629(0.77)
Age	0.0139(5.07***)
Household size	-0.0170(-0.14)
Education	-0.3641(1.96*)
Farm size	0.0443(2.80**)
Income	0.1031(1.21)
Cassava output	0.3866(2.74**)
Chi-square ($\chi 2$)	82.09***
Log likelihood	-32.208
Pseudo R2	0.5271

Source: field survey, 2018. Significant at 5% ** level of probability. HO: Rejected at 5% level of probability

CONCLUSION AND RECOMMENDATIONS

Majority of the women farmers were aware (84.4%) of the technology. More than half of the respondents indicated that NGOs, Cooperative societies were their major sources of information. On the assessment of effectiveness of transfer of odourless cassava fufu technology by the transfer agencies. The grand mean across the entire state on the level of effectiveness of transfer were not effective $\bar{X}$ = 2.85, based on the decision rule of $\bar{X}$ = 3.00. The result on significant relationship between some selected socio-economic characteristics and utilization of the technology indicated that age, education, farm size and cassava output were significantly related to the women farmers' utilization of the technology. This implied that farmers' socio-economic characteristics had a lot of bearing on their ability to partake and utilize a technology. The study Recommended the use of more channels of communication in technology dissemination in other to get the target goal desired by the developers of these technology There is need also to transfer the technology module on time so that intended users can use it and benefit from the technology.

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