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Capacity Building on Cocoyam Value Additions Training for Rural Women in Abia State, Nigeria

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Abstract

The National Root Crops Research Institution (NRCRI) Umudike embarked on massive capacity building and extension of technologies of new and improved food forms of cocoyam to rural farmers/women groups from 2005 to date in this country generally and south-east agricultural zone in particular. This study investigated how this training and extension of the technologies has empowered rural women to become entrepreneurs at various levels. A structured interview scheduled, were administered to 120 farmers in 2 agricultural zones of Abia (Ohafia and Umuahia). Data collected were analysed using descriptive and inferential statistics like linear regression model and t-test was used to test the hypothesis. The result revealed that majority of the respondents was married (88%) while 12% were single and were reasonably aware of the technologies. However, on the utilization of the technologies, out of the 5 processing technologies, only 3 had high level of utilization, processing of cocoyam into cake ($\bar{x}$=3.7) Bread ($\bar{x}$3.5 and Chin-chin ($\bar{x}$=3.2). Also a tangible impact was made in the livelihood of the respondents as there was a reasonable difference in income of the respondents after the training. The major challenges associated with the utilization were no extension agents to answer their questions ($\bar{x}$ =3.90) lack of commitment =($\bar{x}$ =3.25 and marketing of product = ($\bar{x}$=3.17) among others. It is therefore recommended that re-training and provision of market facilities should be intensified to enhance the utilization of the processing technologies and their impact among the respondents.

Keywords: Processing technologies; Value addition and training

Introduction

Nigeria is the world's largest producers of cocoyam accounting for about 37% of the total world output. Cocoyam (xanthosoma and colocasia spp) is an important staple crop cultivated in the southern part of Nigeria [1]. It is variously grown by resource poor farmers, mostly women who intercrop cocoyam with yam, maize plantain among others [2] Colocasia esculents otherwise known as tare is more popular than xanthosoma sagittaifolium, also known as tanna. However, cocoyam has suffered stiff competition from yam which is preferred for consumption and from cassava which yield more heavily and required less one [3]. Agricultural produce are known to be highly perishable, hence most rural farmers do not get the required or desired reward for their work as most of their produce are lost a day or two after harvest. Based on this the National Root Crop Research Institute (NRCRI) Umudike which had the national mandate to research into root and tuber crops developed some processing technologies to reduce the perishability of the products and add value to these crops. The essence is to ensure that these crops can be put to wider uses in the home, for income generation and probably for export purposes.

Aniedu et al. [4] cited that because of their effective performance (NRCRI) was adjudge the best food exhibitor. To this effect, groups and individuals all over Nigeria appreciated this development and requested to be trained in those technologies.

Rural women globally faces persistent gaps in access to resources, knowledge and services, all underpinned by persistent inequalities in rights. So despite repeated public commitments to gender equality, governments, have by and large failed to meet even the most fundamental targets. About 79% of women in rural Nigeria consider agriculture as their primary source of livelihood and on average, comprise 43% of the agricultural labour force in developing countries. Yet, because of cultural attitudes, discrimination and a lack of recognition for the role in food production, women have less access to productive resources [5]. The author further explained that only 15% of landowners are women and they receive less than 10% of credit

and 70% of extension services. As a result, their productivity lags behind, negatively affecting their livelihoods and that of the families. Lack of access to services and infrastructures takes a way time from education and other opportunities and this gap in access disproportionately affects women and girls. The outcome of the primary importance of gender equality and location specific commitments to support women's access to resources, knowledge, services, education, training and markets. The conference also recommends the need to improve women marketing skills through entrepreneurship training. National Root Crop Research Institute (NRCRI), Umudike recently developed several cocoyam value added technologies aimed at addressing the high perishability of cocoyam tuber (corns and cormels). According to Aniedu 2004 these emerge as a result of rising demand for making cocoyam products available in more widely and readily useable forms. The development of a diverse value adding technologies for cocoyam is timely, appropriate [6].

In the traditional farming system women 'own' and plant cocoyam after the men have planted their yam, hence it is regarded as a women's crop. As a result of male pit migration in search of white collar jobs, certain tasks that were traditionally performed by men are now left in the hands of women folk. That is gender based differentiation of farm tasks appear to be disappearing. Given the importance of cocoyam and the fact that its cultivation is proceeding, it becomes compelling to examine the processing and utilization of this crop. People regard cocoyam as poor man's food, and there was little or no processing of this crop to make it valuable; hence farmer's earnings were not commensurate with the efforts they put in cocoyam production. In an effort to guide against poor earnings and encourage people to eat cocoyam, the Federal Government of Nigeria came up with Cocoyam Rebirth Programme. The purpose of which was to promote the new and improved forms of processing and utilization of cocoyam as well as empower the rural communities through training programmes, for sustainable food production, food security, income generation increased source of medicine for diabetic patients and possible foreign exchange earnings.

Aniedu [4] indicated that such personal issues such as gender, availability of resources required for the use of innovation, priority and benefits expected to be gained motivate people to adopt innovations. This study is therefore aimed at investing how this training programme of NRCRI has empowered the rural women.

This paper therefore is to investigation how the training has empowered the rural women in the study area; with the following specific objectives; to:

1. Examine the socio-economic characteristics of the respondents in the study area.
2. Ascertain the level of utilization of the cocoyam value addition technologies extended to the rural women through training.
3. Scertain the effect of the technologies on the income of the respondents.

Hypothesis

There is no significant relationship between the training received by the respondents and their income after the training in the study area.

Methodology

The study area was Abia State, made of 17 Local Government Areas and 3 agricultural zones. Out of the three agricultural zones, 2 zones were purposively selected for the study namely Ohafia and Umuahia zone respectively. These zone were chosen because they have vast and fertile land for cocoyam production. Agriculture is the major occupation employing about 60 to 70% of the inhabitants mainly women. The farm activities provide most of the time the household income, with family labour as major source of labour. The degree of involvement in farm activities especially cocoyam production is skewed in favour of the female folk [7]. Multistage sampling procedure was used in the selection of the sample size. Out of the 3 agricultural zones, 2 were purposively selected (Ohafia and Umuahia Zone) respectively. From these zones, 2 Local Government Area were selected, followed by a selection of 3 Block from each LGA and one cell from each Block, and from each 10 rural women who are actively involved in cocoyam production, bringing the total to 120 respondents, with the aid of the extension agents supervising each of the selected blocks. The rural women were subjected to 5 different value addition technologies which lasted for 2 weeks in each agricultural zone; later (4 months) after the training, questionnaire and Focus Group Discussion were used to ascertain information on socio-economic characteristics and the level of adoption of each of the cocoyam value addition processing technologies exposed to the women. Data collected were analysed using descriptive and inferential statistics.

Objective one (1 and 4) was analysed using descriptive statistics. Objective two (2) which was to measure level of utilization of the value addition technologies was analysed using the five-point likerts scale.

The extent of adoption/utilization by the respondents was measured using 5 point Likert scale; aware (1), interest (2), evaluation (3), trial (4), and adoption 5, following to determine the mean adoption level X. The mean score X of each item was computed by multiplying the frequency of each response pattern with its nominal value and divided the sum with the number of respondents to the item. This can be summarized with the equation below:

$$X = \frac{\Sigma fn}{n}$$

Where = Mean score

Σ = Summation

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N = frequency

N = Likert nominal value

$\dot{X}$ = 1+2+3+4+5

5

= 15

5

= 3.0

Objective 3, to determine the effect of the training on income of the respondents was analyzed using linear regression.

The implicit form is stated below:

Y = f (X1 + e)

Where Y = (training) - Dependent variable)

and

X1 = (Income measured in naira).

Hypothesis testing

There is no significant difference between the income of the respondents before and after the training was tested using t-test model

$$t\ cal = \frac{\bar{x}-\bar{x}_2}{\sqrt{sx_1^{2-} + sx_2 2-}{n_1 + n_2}}$$

Where $\bar{x}_1$ = mean income of the respondents before the training

$\bar{x}_2$ = Mean income of the respondents after the training

sx_1^{2-} = Squared standard deviation of income before training

sx_2^{2-} = Squared standard deviation of income after training

n1 = Number of sampled respondents before training

n2 = Number of sampled respondents after training

The socio-economic characteristics of the respondents are shown on Table 1. The result reveals that majority of the farmers were between the age range of (35-40) years representing 25%. This age group are known for their physical ability, productive and mental alertness in learning new technologies more than older farmers [7]. The implication of this finding shows that the women were strong being in their productive age [8]. The table also reveal that about 88% of the respondents were married while only 12% were single. This implies that majority of the married women dominated the training programme. This must have been necessitated based on the need to augment family incomes in addition to their traditional roles in the family as mothers and care producers. This result further indicates that about 27% of the respondents had no formal education, 38% had primary education, 25% had secondary education, only insignificant percent of 10% had tertiary education. Educated farmers are expected to be more receptive to technologies, while farmers with low level of education or without education would be less receptive to improved farming, techniques or utilization of new technologies [3].

Table 1: Socio-economic Characteristics of the Respondents.

Variables	Frequency	Percentages
Age		
25-30	23	18.7
35-40	30	25
45-50	29	24.2
55-60	23	18.7
65-70	15	12.5
Total	120	100
Income N'000		
10,000-20,000	24	20
30,000-40,000	25	20.8
50,000-60,000	44	36.7
70,000+	27	22.5
Farming Experience		
15-20	32	26.7
25-30	55	45.8
35-40	21	17.5
Marital Status		
Married	105	87.5
Single	15	12.5
Total	120	100
Member of Cooperatives		
Belong to Cooperative	50	41.7
None	70	58.3
Total	120	100
Source: Field data, 2016		

The table further revealed that about 37% of the respondents earned below N50,000-60,000, per annum, 23% of the respondents earned N70, 000 and above, 21% earned between N30,000-40,000 while about 20% of the respondents earned between N10, 000-20,000 per annum. The table further revealed that respondent has a mean farming experience of 20.5 years. With more experience, a farmer can become less averse to the risk implied by adopting a new technology [9]. The table also reveal that 42% of the respondents belong to cooperatives while 58% of the respondent did not belong to cooperative organizations.

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Belonging to cooperative societies will enhance participation in an intervention programme and Odoemenam [5] opined that cooperative membership enhances access to information on improved technologies.

The implication of the result is that respondents that belong to cooperative societies may have more access to agriculture, information and production inputs [10]. Acquisition of information about new technology demystifies it and makes it more available to farmers [11]. Information enhances the uncertainty about technology performance hence may change individuals assessment from purely subjective to objective over time.

The results in Table 2 show the level of utilization of cocoyam value addition technologies by the respondents in the study area. The result show that processing into cake has a mean score of ($\bar{x}$=3.7), Bread ($\bar{x}$=3.5), Chin-Chin ($\bar{x}$ = 3.2), Biscuit ($\bar{x}$= 3.05) and Chips ($\bar{x}$=2.9). Three out of the five technologies were above the total mean score of $\dot{X}$=3.3) therefore the reaming two were utilized less. The main reasons given by the women for high utilization of those technologies include, profitability, easy to handle, cultural acceptance and it is not labour intensive.

Table 2: Level of Utilization of Cocoyam Value Addition Technologies in the study area.

Variable Value added Technologies	Total Adoption Score	Mean
Biscuit	366	3.05
Chin-Chin	388	3.2
Cakes	442	3.7
Bread	421	3.5
Chips	348	2.9

Table 3 show simple linear regression analysis of the effect of cocoyam value addition on the income of the respondents in the study area. The R2 value was 0.810 indicating that about 81.0% of the variations in the dependent variable were accounted for while 19% was due to error. The F-ratio was statistically significant at 1% level of probability, indicating a goodness of fit of the model for the analysis. The coefficient of income was statistically significant at 1% level of probability and positively related. This result implies that a unit increase in the use of value added product of cocoyam technology will lead to a corresponding increase in the income of the respondents in the study area. This also implies that any increase in income will lead to increase in technology utilization among the farmers. Kehind [12] noted that the decision to adopt is often an investment decision [13-16].

Table 3: Effect of the training on income of the respondents.

Variable	Estimates	Std. Error	T-test
Constant	3976.563	7939.174	10.976
Income	856	0.064	5.89
R2	0.81		
R-2	0.778		
F-ratio	46.77		

Source: Field data, 2016

Table 4 shows that the mean income of the respondents after training was N 21,930.00 while before the training it was N9.073.67 with a paired mean of N 12,856.33. This implies that the income of the respondents after the NRCRI capacity building training on value addition are higher than their income before the training. Cocoyam duration after harvest or shelf life is low, based on this the National Root Crop Research Institute processing technology has not only empowered the women for sustainable livelihood but has made them entrepreneurs in various categories. Given that the variables were significant at 1% level of probability, it shows that there is a significant difference between their incomes before and after the training. It could be inferred that the intervention impacted positively on the incomes of the trainees. Therefore, we reject the null hypothesis which stated that there is no significant difference between the income of the respondents before and after training, and accept the alternatives.

Table 4: Paired sample test income of the respondents before and after the NRCRI training in the study (N=120).

Variables	Mean	Paired	95% Confidence Interval of The Difference	
			Lower	Upper
Trainee's Income after Intervention	*21,930.00	12,856.33**	9,771.02	15,941,64
Trainee's Income before Intervention	9,073.67			
After-Before	12,856.33**			

Table 5, revealed the challenges faced by the respondents during and after training. From the results lacking of training facilities had ($\dot{X}$=3.25). To have a healthy entrepreneurs training facilities and support must be easily available to the farmers Effective arrangement need to be developed to regularly provide education and training at the right time, in the right place and with the right balance of technical knowledge and practical skills, marketing of products ($\dot{X}$3.17). The respondents realize

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that capturing value requires producing for buyers and final consumer. But just producing and selling is insufficient. This requires greater understanding and knowledge of value chain and their different elements. When they actively look for ways to capture the added value within the value chain, this will increase their products; inadequate knowledge ($\dot{X}$=2.62). Daily pressures on the farm business require farmers to make immediate decision based on knowledge acquired during the training. These decision need to be made within a broader vision that guides the development of the bunnies enterprise. The respondents must ensure that they are managing their enterprise with a long term plan for the business so that it stays on course; lack of transport facilities (x=2.9); lack of commitment ($\bar{x}$ = 3.25) New technologies are needed in order to adapt to a changing economy and changing market. The respondents are not only consumers and users of these technologies but should also be active participants in designing testing, adapting and introducing them to the farming systems. Lack of support service ($\bar{x}$=3.90). The women complied inadequate support and inefficient services. Farmers advancing through the five stages of the technologies will need information, advice and support. The support needs should cover all aspect of running a profitable market oriented enterprise. According to Aniedu [3] for rural poor women to adopt or utilize technologies these challenges should be addressed. Otherwise, any technology that will add more work to them will not be readily acceptable by the women.

Table 5: Challenges Faced by the respondents training in utilizing the value addition technology.

Variables	Mean	Ranking
Lack of training facilities	2.38	7
Marketing of Products	3.77	3
Inadequate Knowledge	2.63	5
Lack of Transport Facilities	2.9	4
Inadequate Training Facilities	2.62	6
Lack of Commitment	3.25	2
Lack of Support Service and Trained Extension	3.9	1

Conclusion

The study revealed that the cocoyam value addition technologies recorded moderate utilization rate in the study area. The reason may be attributed to the nearness of the institute and probably reinforcemt by extension activities in the state once in a while.

Recommendation

Therefore the paper recommends that provision of market, equipment and facilities are also necessary to ensure enhanced utilization and tangible impact of capacity building on the livelihood of the women.

To enable the women adopt this cocoyam value addition technologies continuously, funds and be made available and provision of energy and time serving device to reduce drudgery.

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