ENTREPRENEURIAL COMPETENCY IMPROVEMENT NEEDS OF WOMEN IN AGRICULTURE IN PROCESSING AFRICAN YAM BEAN SEEDS FOR FOOD SECURITY IN NORTH CENTRAL STATES OF NIGERIA

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ABSTRACT

The study was carried out to determine entrepreneurial competency improvement needs of women in agriculture in processing yam bean seeds (Sphenostylis stenocarpa) for food security in North- central States of Nigeria. To achieve this objective, four research questions were developed and answered. The study adopted survey research design. A 45 item structured questionnaire was developed from the literature reviewed for the study and utilized for collecting data. The population for the study was 205 women farmers who produce and or process local bean seeds. The structured questionnaire was face validated by 3 experts. Cronbach Alpha method was employed to determine the reliability of the questionnaire items and a coefficient of 0.91 was obtained. The questionnaire was administered on 205 respondents. One hundred and ninety eight copies of questionnaire were retrieved and analysed. Weighted mean and Improvement Needed Index were used to answer the research questions. A focus group discussion was involved to obtain further information on the level of need and how they can perform the competency items to improve the data obtained from the survey. The study found out that 45 items identified by the study were required in preparing yam bean seeds while the women were deficient in 42 of them. It was therefore recommended that the identified competencies be utilised to retrain the women to make them economically viable in the processing of yam bean seeds for food security in North- central states of Nigeria.

KEYWORDS: Entrepreneurial, Competencies, Yam Bean, Nigeria

INTRODUCTION

African Yam Bean (AYB) (*Sphenostylis stenocarpa*) is a legume crop that is cultivated by the traditional farmers in many parts of Nigeria (see the picture in Appendix). It has its tribal names in the country as wakesuya in Hausa, uzoaku in Igbo (ijiriji in Nsukka) and sese in Yoruba. Potter and Doyle in Akande (2009) said that the crop originated either from West and Central Africa. According to the authors, the crop is an annual with vine-like stems that require staking. Due to its climbing characteristics, the crop is usually inter-cropped with yam so that its vines can utilize yam stake for climbing thereby saving labour for staking it as a sole crop.

The crop is important to the soil and man; Santo, Calvalanti and Coelho (1995) stated that the plant fixes Nitrogen to the soil. Akande (2009) said that the crop has the capacity of restoring soil fertility and providing carbohydrate, fibre, protein and minerals for man. For the crop to supply the inherent food nutrient to man, the author stated that the seeds require cooking either fresh or dry and eaten alone or with maize, rice or yam. The seeds can therefore be used to replace

cowpea in most food preparations especially during lean periods of the year when food is generally scarce. It is also observed among families in rural areas that the water from cooked beans is taken by lactating mother to stimulate breast milk secretion.

In North-central states of Nigeria, yam bean seed is eaten in various forms such as cooked, roasted or steamed. In cooked form, the fresh seeds are boiled specifically with yam while the dry seeds are prepared with dried cocoyam (achicha in Igbo), maize or yam and eaten as main dish. In roasting, the dry seeds are heated in hot container until they split open with the help of pestle or any other appropriate object; allowed to cool and eaten as buffers with either palm kernel or coconut. Roasting is usually carried out in small quantity at a time. In steaming, the dry seeds are initially processed into flour and then prepared by mixing the flour with water and some ingredients like oil, salt, fish or meat to taste. The mixture is wrapped in either fresh broad leaves or small cellophane bags to size and steamed on fire until it is done. It is allowed to cool and eaten alone or with any complementary food such as garri or pap. The steaming process is carried out in small quantity to meet the family emergency needs and sometimes sold as snacks. To achieve the objective of steaming it must be exposed to rigorous processing.

Processing in the view of Wikipedia (2008) is the act of taking something through an established set of procedure to convert it from one form to another. With reference to this study, processing means the act of changing dry yam bean from seeds through roasting and grinding to flour by women in agriculture. Women in North central states of Nigeria, in the context of this study, are married adult females caring for families with majority of them engaging in agricultural activities including processing of yam bean seeds in small quantities for the household. In a few case, some of the women roast the dry seeds and sell them with palm kernel in open markets. This practice fall short of processing the bean beyond roasting for eating as buffers to reduce hunger. That is, as buffers, it is not as either food or diet but just to hold hunger briefly for the main dish that comes much later. In most cases, the women that process the yam bean are old and very much attached to their culture in the processing of the crop. Their practices do not guarantee large scale processing and preservation of the bean for food security during the time of food scarcity. If the women are empowered with entrepreneurial competencies in the use of appropriate facilities and enabling technologies, it can be a vital source of income to them and food security in North central states of Nigeria and beyond.

Entrepreneurial in the view of Meredith, Nelson and Neck (1990), means the act of combining personal characteristics, financial means and resources within ones environment; while Jaja (2004) said that it is the act of having quality business vision, opportunity, mission strategies and resources. As applied to this study, entrepreneurial means the ability to find an opportunity to gather necessary resources to invest in a business in which one is interested and skilled. These abilities are reorganized in terms of competencies demonstrated by the individual in a business.

Competency in the view of Hamilton in Olaitan (2003) means behaviours, skills and attitudes that are required for successful performance of a task. Competency as applied to yam bean processing refers to the knowledge, skills and attitudes that are required for changing the dry seeds to flour through the use of small scale technologies that can encourage large scale processing of the crop beyond the local or traditional method in order to improve their processing capabilities.

Improvement in the opinion of Ifeanyieze (2012) means the act of making something or a situation better than it used to be. Improvement with regard to this study is empowering women with the entrepreneurial competencies above

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their cultural practices in processing yam bean into flour for food security and utilization during lean periods of the year. Before an individual is recommended for improvement, the level to which the improvement is needed must be determined.

In order to determine the level of improvement needed by the women in processing yam bean seeds, the need gap was first determined. Need gap, in the view of Rosett and Sheldon (2001) is the difference between the perceived need (real performance) and actual need (expected performance). That is, the actual need (AN) minus the present performance level (PPL) equals the need gap (NG). To find out the need gap requires a need-gap analysis which could be accomplished through observation and perception. In observation, individuals are carefully looked at (watched) while performing a task in order to find out their level of performance in the task. After the observation, the difference between the expected level of performance and the real performance level indicates the need gap in which those observed require training. Perception, in the opinion of Rosett and Sheldon (2001), is also used in determining the need gap. Usually, perception level is obtained through the opinions of the individuals who assess themselves.

In the context of this study, need gap analysis constituted the difference between the perceived level of performance and the expected performance of women in processing yam bean seeds into flour for food security through perception. That is, copies of questionnaire were given to experts that process yam bean seeds into flour to find out the level at which each skill item in the questionnaire was needed in processing the crop and furthermore, each woman was asked to rate herself on the extent she could perform each of the competency items if exposed to it. The difference between the two views, that is, the level of need and the level of performance constituted the performance gap (PG) in which the women required re-training for improved performance. The purpose of this study therefore, was to determine the competency improvement needs of women engaged in yam bean processing with the view to enhancing their income and for food security during lean period of the year in North central states of Nigeria. Specifically, the study sought to determine the competency improvement needs of women in

- Planning for yam bean processing,

- Processing yam bean seeds into floor

- Storage of processed yam bean seeds and

- Marketing of processed yam bean seeds for food security in North central states of Nigeria.

METHODOLOGY

The study adopted a survey research design making use of Borich needs assessment method. Borich needs assessment method is an educational survey research design that permits the population studied to assess themselves as they are in the best position to provide the most correct answer on the extents they could perform required tasks. The area of the study was North central states of Nigeria. The population for the study was 205 made up of women farmers who process yam bean seeds for local consumption.

The entire population of women farmers was involved in the study due to their manageable size. Four research questions were developed and answered in line with the specific purpose of the study. A 45 item structured questionnaire was developed from the literature review for the study and utilised for collecting data from the respondents. The questionnaire was divided into two categories of needed and performance. The needed category was assigned a

four response option of Highly Needed (HN)= 4, Averagely Needed (AN)= 3, Slightly Needed (SN)= 2 and Not Needed (NN)= 1 while the performance category was also assigned a four response options of High Performance (HP)= 4, Average Performance (AP)= 3, Low Performance (LP)= 2 and No Performance (NP)= 1.

Three experts face validated the questionnaire items. Cronbach alpha method was adopted in determining the reliability of the items and a coefficient of 0.91 was obtained. 205 copies of the questionnaire were administered on the respondents through three trained research assistants selected based on their familiarity with the study area. The respondents (women) were asked to rate each competency item at the level to which it was needed and at the level to which they could perform each of the items. This helped the researchers to take decision on the item in which improvement was needed. Out of 205 copies of the questionnaire distributed, a total of 198 copies were retrieved and analysed. Weighted mean and Improvement Need Index (INI) were used to answer the research questions. In determining the performance gap of the women in each of the entrepreneurial competency item, the following steps as developed by Olaitan and Ndomi (2001) were followed:

- The weighted mean of each item under the needed category was calculated $(\overline{X}_n)$.

- The weighted mean of each item under performance category was also calculated $(\overline{X}_p)$

- The difference between the two means for each item $(\overline{X}_n - \overline{X}_{p = PG})$ was determined for decision making on improvement needed thus:

- Where the difference was zero, $(\overline{X}_n - \overline{X}_{p = 0})$, there was no need for improvement because the level at which the item was needed was equal to the level the women could perform the items.

- Where the difference was positive $(\overline{X}_n - \overline{X}_{p = +})$, there was need for improvement because the level at which the item was needed was higher than the level at which the women could perform the item.

- Where the difference is negative $(\overline{X}_n - \overline{X}_{p = -})$, there was no need for improvement because the level of performance was greater than the level of need, meaning that the respondents can perform the competency item above the level needed.

A focus group discussion was involved to obtain further information on the level of need of some of the competencies in processing yam bean seeds and how they could perform them. The information gathered from the discussion was analysed and used as confirmatory result to improve the data obtained from the survey.

RESULTS

The results of the study were obtained from the research questions answered and presented in Tables 1-4.

Research Question 1

What were the competencies in planning for yam bean processing where women in agriculture need improvement?

The data answering research question one were presented in table 1.

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**Table 1: Performance Gap Analysis of Women in Agriculture on the
Competencies in Planning for Yam Bean Processing N=198**

S/N	Item Statement	$\overline{X}_n$	$\overline{X}_p$	$\overline{X}_n - \overline{X}_P$	Remark
1	Formulate specific objectives for yam bean processing.	3.65	2.12	1.53	Improvement Needed
2	Review the objectives with change in demand and supply either by integrating or reducing a few things	3.68	2.59	1.09	Improvement Needed
3	Identify sources of fund	3.13	2.75	0.38	Improvement Needed
4	Obtain suitable site for the enterprise	3.50	3.25	0.25	Improvement Needed
5	Identify market outlet for yam bean products	3.50	3.13	0.37	Improvement Needed
6	Identify sources of obtaining yam bean seed in large quantity	3.65	3.25	0.31	Improvement Needed
7	Identify relevant facilities/materials.	3.13	2.88	0.25	Improvement Needed
8	Source for the identified facilities/materials.	3.56	2.13	1.62	Improvement Needed
9	Identify qualified personnel for the business	3.54	3.50	0.04	Improvement Needed
10	Employ the identified qualified personnel at affordable price to the enterprise.	3.48	2.25	1.23	Improvement Needed
11	Identify relevant records to be kept by the enterprise	3.00	2.38	1.62	Improvement Needed
12	Budget for various activities that need to be carried.	3.13	2.00	1.13	Improvement Needed
13	Make provision for contingencies	3.20	2.01	1.19	Improvement Needed

The data presented in table 1 revealed that the performance gap values of all the 13 items in planning ranged from 0.04-1.62 and were positive. These performance gap values indicated that improvement was needed by the women in all the 13 competency items in planning for the processing of yam bean seeds into flour in North central states of Nigeria.

Research Question 2

What were the competencies in processing yam bean where women in agriculture need improvement?

The data answering research question two were presented in table 2

**Table 2: Performance Gap Analysis of Women in Agriculture on the
Competencies in Processing Yam Bean Seeds into Flour N= 198**

S/N	Item Statement (Processing Competency Items)	$\overline{X}_n$	$\overline{X}_p$	$\overline{X}_n - \overline{X}_p$ (PG)	Remark
1	Obtain yam bean seeds in large quantity	3.65	3.50	0.15	Improvement Needed
2	Separate clean seeds from the bad and shrink ones.	3.63	3.38	0.25	Improvement Needed
3	Set fire for roasting the bean seeds	3.55	3.42	0.13	Improvement Needed
4	Place the roasting pan on the stable fire	3.50	3.63	-0.07	Improvement Needed
5	Heat the pan to until it becomes hot.	3.50	3.50	0.00	Improvement Not Needed
6	Pour manageable quantity of the seeds inside the roasting pan	3.13	3.13	0.00	Improvement Not Needed
7	Warm the quantity for 3 minutes	3.22	3.15	0.07	Improvement Not Needed
8	Stir the seeds with wooden frying spoon until it begins to crack	3.52	3.00	0.52	Improvement Needed
9	Apply a little energy using a500g object (pestle) to split open the seeds while still on fire	3.38	2.28	1.10	Improvement Needed
10	Continue roasting and stirring until the split seeds turn white-brown	3.13	2.55	0.58	Improvement Needed
11	Pour out the roasted beans into a basin or on a mat	3.62	3.11	0.51	Improvement Needed
12	Pour another manageable quantity into the roasting pan	3.25	2.31	0.94	Improvement Needed
13	Repeat the roasting process for other sets.	3.38	2.75	0.63	Improvement Needed
14	Winnow the roasted beans to remove chaff.	3.50	2.75	0.75	Improvement Needed
15	Grind the roasted beans into flour.	3.25	2.00	1.25	Improvement Needed
16	Sieve the four with 0.02mm diameter sieve	3.38	3.26	0.12	Improvement Needed

Table 2: Contd.,

17	Re-grind and sieve until the chaff remains small (1/20) of the initial quantity	3.35	2.38	0.97	Improvement Needed
18	Package the flour into sachets of different weights in grams or kilograms	3.55	3.19	0.36	Improvement Needed
19	Market the product when required or store for food security	3.63	2.75	0.88	Improvement Needed

The data presented in table 2 revealed that the performance gap values of 16 out of 19 items in processing ranged from 0.07-1.25 and were positive. These performance gap values of the 16 items indicated that improvement was needed in them by women in agriculture for processing yam bean into flour in North central states of Nigeria. However, table 2 further revealed that three of the items (4, 5 & 6) had their performance gap values as -0.07 and 0.00, indicating that the women did not need improvement in the three competency item because they could perform item no 4 more than the level at which the item was needed while the level at which the item numbers 5 and 6 were required were equal to the level the women could perform the items.

Research Question 3

What were the competencies in storage of yam bean where women in agriculture need improvement?

The data answering research question three were presented in table 3

Table 3: Performance Gap Analysis of Women in Agriculture on the Competencies in Storage of Yam Bean Flour N=198

S/N	Item Statement	$\overline{X}_n$	$\overline{X}_p$	$\overline{X}_n - \overline{X}_p$	Remark
1	The sachets into cartons and steeple	3.63	2.13	1.50	Improvement Needed
2	Keep the cartons off the ground in a raised plat form	3.38	2.00	1.38	Improvement Needed
3	Keep in a cool dry place and dark location	3.75	2.00	1.75	Improvement Needed
4	Maintain the storage temperature below 70^{of} but above 32^{of}	3.33	2.88	0.45	Improvement Needed
5	Keep the storage area clean	3.13	2.00	1.13	Improvement Needed
6	Fumigate the store occasionally to guard against rats and insects.	3.25	2.10	0.15	Improvement Needed

Data presented in table 3 revealed that the performance gap values of all the 6 items in storage ranged from 0.15-1.75 and were positive. These performance gap values indicated that women in agriculture need improvement in all the 6 competency items in storage of yam bean flour in North central states of Nigeria.

Research Question 4

What were the competencies in marketing of yam bean flour where women in agriculture need improvement?

The data answering the research question were presented in table 4

Table 4: Performance Gap Analysis of Women in Agriculture on the Competencies in Marketing Yam Bean Flour N=105

S/N	Item Statement	$\overline{X}_n$	$\overline{X}_p$	$\overline{X}_n - \overline{X}_p$ (PG)	Remark
1	Grade the product based on weight	3.00	2.00	1.00	Improvement Needed
2	Determine the prices for different grades	2.97	2.50	0.47	Improvement Needed
3	Advertise the product	3.55	2.13	1.42	Improvement Needed
4	Determine the means of supplying to the buyers for maximum profit	3.25	1.88	1.37	Improvement Needed

Table 4: Contd.,

5	Transport to the market or to the buyers on demand	3.11	2.63	0.48	Improvement Needed
6	Collect cash at the point of sale and maintain good public relationship with customers	3.38	2.38	1.00	Improvement Needed
7	Reconcile sales with production cost	3.38	2.00	1.38	Improvement Needed

Data presented in table 4 revealed that the performance gap values of all the 7 items in marketing ranged from 0.47-1.77 and were positive. These performance gap values indicated that improvement was needed in all the 7 competency items for marketing yam bean flour by women in North central states of Nigeria.

DISCUSSIONS OF RESULTS

The results of this study on the competency improvement needs of women in agriculture in processing yam bean seeds revealed that 45 items were needed but the women were deficient in 42. The findings of this study were in agreement with the findings of Sowande (2002) in a study on Technical Competency Improvement Needs of Metalwork Teachers in Nigerian Colleges of Education. The author found out that the metalwork teachers needed improvement in 80 competencies for better performance in the field.

The findings of this study were further in conformity with the findings of Agolu (2007) in a study on Competency Improvement Needs of Supervisors of Teachers of Agriculture in Primary and Post Primary Schools in Federal Capital Territory Abuja. The author found out that supervisors of teachers of agriculture needed improvement in 107 supervisory competency items to enable them become more effective in performance of their supervisory roles. The findings of the study were in line with the findings of Ifeanyieze and Olaitan (2009) in a study on requisite skills required for capacity building needs of teachers of Agriculture for effective teaching of yam production in Colleges of Education in South-eastern Nigeria where it was found out that teachers needed capacity building in 56 skills (8 items in instruction, 9 items in each of pre-planting and post planting operations, 16 items in processing and 13 items in storage) for effective teaching in the colleges.

The findings of the study were in line with the findings of Amusa (2009) in a study on competency improvement needs of farmers in cocoyam production in Ekiti State where it was found out that farmers needed improvement in 92 competency items for improved production of cocoyam in the state.

The findings of the study were also in conformity with the findings of Dimelu (2010) in a study on competency improvement needs of teachers of Home Economics in the use of ICT for effective teaching in Colleges of education in South-eastern Nigeria where it was found out that teachers of Home economic needed improvement in 44 items (16 competency items in word processing, 13 competency items in internet usage and 15 competency items in power-point presentation) in the use of ICT. The findings of the above authors in their various studies helped to add more credibility to the findings of this study on the improvement needs of women in agriculture in processing yam bean seeds in North central states of Nigeria.

CONCLUSIONS

From this study, women in agriculture were found deficient in 13 competency items in planning, 16 in processing, 6 in storage and 7 in marketing of yam bean. Their deficiency could be traced to their culture which resulted into their

processing of yam bean seeds for family consumption and very little for sale in the local markets. This study has provided information on the performance gaps or areas where the women in agriculture need improvement in processing yam bean seeds economically for lifelong living. To make these women economically viable in the processing of yam bean into flour in large quantity for food security, it was recommended that the identified 45 competency items in which they were found deficient in 42 be utilized to re-train them with satisfactory facilities, affordable and manageable technologies.

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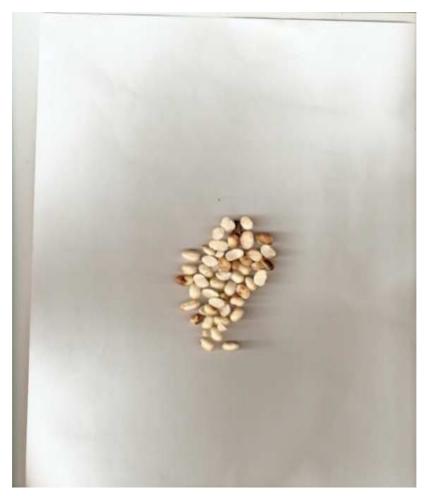
APPENDICES

Figure 1

Figure 2