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# COMPETENCY IMPROVEMENT NEEDS OF WOMEN IN AGRICULTURE IN PROCESSING COCOYAM INTO FLOUR AND CHIPS FOR FOOD SECURITY IN SOUTH EASTERN NIGERIA.

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## Abstract

*This study focused on the identification of competency improvement needs of women in agriculture (WIA) in processing cocoyam into flour and chips. To achieve these objectives, four research questions guided the study. Descriptive survey research design was adopted for this study. The study was conducted in South-eastern Nigeria made up of Abia, Anambra, Ebonyi, Enugu and Imo State The target population for this study was 362 women processors. It was found out that women processors required improvement in cocoyam processing enterprise as follows: planning competencies (12 competency items), processing cocoyam into flour (13 competency items), processing cocoyam into chips (13 competency items) and marketing (7 competency items). It was therefore recommended that co-operatives, government agencies, and relevant NGOs should help use the findings of this study to improve acquisition of competencies of women in cocoyam processing for food security in South-Eastern Nigeria.*

**Competency Improvement needs of Women in Agriculture in Processing Cocoyam into Flour and Chips for Food Security in South Eastern Nigeria.**

## INTRODUCTION

Cocoyam varieties (*Xanthosoma sagittifolium*) called tannia and (*Colocasia esculenta*) called taro are important staple food crop grown extensively in south-eastern Nigeria. Edet and Nsukka (2000) stated that cocoyam is a member of Araceae family and in the group of monocot plant. Cocoyam is one of the most valuable root crops in Nigeria, second in West Africa. Ugulu (1996) explained that cocoyam has broad leaves with long stem attached to a corm which grows into the soil with cormels. It is the cormels that are of great economic, social and nutritional importance to the people of the south-eastern Nigeria. Iwuoha and Kalu (2000) emphasized that cocoyam can be processed into cocoyam flour, chips and poi a processed form of taro which is popular in Hawaiian and Polynesian. The author further stated that cocoyam flour is highly digestible and therefore suitable for feeding invalids, for making confectionaries and baby food.

In south eastern Nigerian , the flour from cocoyam can be made into fufu as food, or backed into biscuits or pellets for feeding livestock as concentrates while cocoyam chips can be mixed with other beans such as "fiofio" (Kajanus kajan) as food to form a complete diet. In the area of the study, cocoyam production involved, growing of cocoyam till maturity, harvesting, processing and marketing. Ihekoronye in Akwaji (2006) defined processing as activities designed to alter the shape and size of a product, with a view of improving its handling and quality. Also Hornby (2006) define processing as a series of things that are carried out in order to achieve a particular result. In the context of this paper, cocoyam processing involves different activities designed to alter the shape and size of cocoyam into flour and chips in order to improve its keeping quality for use in future.

Cocoyam are grown, processed and consumed by women in agriculture in south eastern Nigeria. These women are regarded as mature females who convert cocoyam cormels into flour and chips to improve their keeping quality for food security for the future. Food security in the views of Bill Clinton (2008) is when all people have enough to eat at all time to be healthy and active, and do not have the fear that the situation will change in the future. Anderson (2009) defined food security as access by all people at all time to enough food for active healthy life. Also in the submission of world food summit (1996), food security exist when every person has physical and economic access to all times to healthy and nutritional food in sufficient quantity to cover the needs of their daily national and food preferences in order to live a healthy and active life.

Cocoyam production is seasonal; it is mainly available between the month of August and November. This is the period when women processors processed cocoyam into flour and chips for food security. These women though working hard on the job but are still very poor economically, because they have not been able to development requisite entrepreneurial competences in processing cocoyam beyond the traditional subsistent level as a result of the following reasons.

I. Absence of simplified processing technologies that could be managed by the women themselves to improve their income from the crops due to contracts

II. Absence of well qualified trainers that could impact these competencies to the women without much infringement on their traditional house schedules encompassed in agriculture..
III. Absence of well developed competencies based crop production programme for training women in agriculture including cocoyam.

Competency in the view of Olaitan (2003) is the knowledge, skill, attitudes and judgement which one required in order to perform successful at a specified proficiency programme. Encarta (2009) defined competency as the ability to do something well, measured against a standard especially ability acquired through experience or training. In the context of this study, competency is knowledge, skills and attitude required for success in cocoyam processing by women in south eastern Nigeria. Entrepreneurial competency, therefore, are those special competencies a person should possess in order to go into self employment and succeed. In cocoyam processing enterprise, women in agriculture require competencies in planning, processing and marketing in order to manage resources available effectively, for economic profit. To improve the present standard of women in cocoyam processing for food security, there is therefore need to improve these women entrepreneurially in cocoyam processing in order to retain them economically in the business and attract others into the enterprise.

Improvement in the view of Encarta (2009) is the process of making something better. Therefore improvement in processing cocoyam into flour and chips by women involves the following

a. Making the quality of flour and chips better than they use to be.
b. Economy of time in processing.
c. Processing enough for sell and for food security.
d. Involving simple technology in processing, preservation and storage of cocoyam flour and chips.
e. Improving marketing strategies through information and communication technology (ICT).
f. Ensuring improved exportation of processed cocoyam into other countries for increase foreign exchange earnings.

The purpose of this study therefore, is to identify competency improvement needs of women in agriculture in processing cocoyam into flour and chips for food security in south eastern Nigeria. **Specifically the study sought to**:

1. Identify competency improvement in planning needed by women in agriculture for success in cocoyam processing enterprise.
2. Identify competency improvement in processing cocoyam into flour/chips required by women in agriculture.
3. Identify competency improvement in marketing needed by women in agriculture for success in cocoyam processing enterprise.

(Source: Olaitan and Ndomi 2000)

## METHODOLOGY

Four research questions guided this study. Descriptive survey research design was adopted for the study. Olaitan and Ali (2000) explained survey research design as one which studies large or small population by selecting and analysing data, collected from the group through the use of questionnaire. The design was used to collect data from women processors.

The study was conducted in south eastern Nigeria, made up of Abia, Anambra, Ebonyi, Enugu and Imo state. The population for the study was three hundred and sixty-two (362) women processors. The population was small and therefore the entire population constituted the respondents.

A forty five (45) structured questionnaire developed from the literature review was used for data collection. The questionnaire was divided into two categories of needed and performance. The needed category was assigned a four point response scale of highly needed (4), averagely needed (3), slightly needed (2), and not needed (1) while the performance category was assigned a four point response scale of high performance (HP), average performance (AP), low performance (LP), and no performance (NP) with a corresponding value of 4, 3, 2, and 1 respectively.

Three experts from the department of crop science and vocational teacher education (Agricultural Education) University of Nigeria face validated the questionnaire items. Their suggestions were used to improve the final version of the questionnaire. Split half techniques and cronbach alpha reliability method were involved in determining the internet consistency of the instrument. A reliability of 0.88 was obtained. Five trained research assistance at one assistant per state helped to administer 362 copies of the questionnaire to the respondent.

All the three hundred and sixty-two (362) copies of the questionnaire were retrieved and analysed using weighted mean and Improvement Needed Index (INI) to answer the research questions. To determine the performance gap or improvement needed by women in agriculture in cocoyam processing enterprise, the following steps were taken:

1. The weighted mean of each item under the needed category which is XN was calculated.
2. XP was also calculated.
3. The weighted mean of each item under the performance category which is The difference between the two weighted means for each item (XN – XP) was determined.
    a. Where the difference was zero (0) for each item, there was no need for improvement, because the level at which the item was needed as indicated by the weighted mean was equal to the level at which the women will perform that particular competency
    b. Where the difference was positive (+) for any item, there was need for improvement because the level of needs was higher than the level of performance.
    c. Where the difference is negative (-) for any item, there was no need for improvement because the level of performance was greater than the level of needed, meaning that the respondent could perform the competencies above the level it was needed.

The difference between the means was used to determine the improvement required through the improvement needed index (INI) of 0, 1, 2, 3, where 0 means no improvement needed and three means very high improvement needed.

## RESULTS

The results of the study were obtained from the research questions answered (table 1-4)

**Research question 1.**

What were the competency improvements in planning needed by women in agriculture for processing cocoyam into flour and chips for food security?

***Table 1***

***Performance Gap Analysis of the Mean Ratings of the Responses of Women in Agriculture in Planning Needed for Processing Cocoyam into Flour and Chips for Food Security.***

**N-362**

| S/N | PLANNING COMPETENCY ITEMS | XN | XP | (PG) XN-XP | Remarks |
|---|---|---|---|---|---|
| 1. | Formulate objective for food processing | 3.66 | 2.10 | 1.56 | IN |
| 2. | enterprise. | | | | |
| | Review the objectives with change in demand | 3.05 | 1.11 | 1.94 | IN |
| 3. | and supply situation. | 3.51 | 2.30 | 1.21 | IN |
| 4. | Source for fund for the enterprise | 3.52 | 2.00 | 1.52 | IN |
| 5. | Obtain suitable site for the enterprise | 3.88 | 2.78 | 1.10 | IN |
| 6. | Identify relevant faculties for the enterprise | 3.80 | 2.44 | 1.36 | IN |
| 7. | Source for the faculties for the enterprise | 3.56 | 2.64 | 0.92 | IN |
| 8. | Identify quality personnel for the enterprise | 3.73 | 3.41 | 0.32 | IN |
| 9. | Employ qualified persons at affordable cost to | 3.62 | 2.05 | 1.57 | IN |
| 10. | the enterprise | 3.96 | 3.10 | 0.86 | IN |
| 11. | Identify appropriate records to be kept by the | 3.78 | 2.44 | 1.34 | IN |
| 12 | enterprise | 3.59 | 3.01 | 0.58 | IN |
| | Budget for various activities for the enterprise | | | | |
| | Survey market for acceptance for flour/chips | | | | |
| | Make provision for miscellaneous needed for the enterprise | | | | |

**XN=Mean Needed, XP = Mean Performance IN =Improvement Needed.**

The data presented in table 1 revealed that the performance gap values of all the twelve (12) items ranged from 0.32 – 1.94 and were positive. This performance gap value indicated that improvements were needed in planning by women in agriculture for processing cocoyam into flour and chips for food security,

**Research question 2**

What were the competency improvements needed by women in agriculture for processing cocoyam into flour and chips for food security?

***Table 2:***

***Performance Gap Analysis of the Mean Ratings of the Responses of Women in Agriculture for Processing Cocoyam into Flour for Food Security***

***N-362.***

| S/N | ITEM STATEMENTS | XN – | XP – | (PG) XN-XP | Remarks |
|---|---|---|---|---|---|
| 1. | Determine the cocoyam variety that is most suitable for flour | 3.80 | 2.56 | 1.24 | IN |
| 2. | Purchase the variety of cocoyam for flour | 3.93 | 2.72 | 1.21 | IN |
| 3. | Peel the cormel for quality flour | 3.43 | 2.99 | 0.44 | IN |
| 4. | Slice the peeled cocoyam into flakes | 3.84 | 2.71 | 1.13 | IN |
| 5. | Soak the flakes overnight in water | 3.62 | 2.59 | 1.03 | IN |

| | | | | | |
|---|---|---|---|---|---|
| 6. | Wash the flakes the next day to reduce | 3.87 | 3.50 | 0.37 | IN |
| 7. | offensive odour | 3.91 | 2.52 | 1.39 | IN |
| | Add a few drops of 0.25% of sulphuric acid | | | | |
| 8.. | into the water containing the flakes | 3.48 | 2.10 | 1.38 | IN |
| 9. | Blanch the flakes in boiling water for 4-5mins | 3.43 | 2.85 | 0.58 | IN |
| 10. | Drain off the water | 3.77 | 3.16 | 0.61 | IN |
| 11. | Oven dry the flakes at 57-60◦C to convenience | 3.41 | 2.09 | 1.32 | IN |
| 12. | Mill into flour when thoroughly dried | 2.98 | 3.36 | -0.38 | INN |
| 13. | Pack into bags, polythene bags of different sizes | 3.70 | 2.66 | 1.04 | IN |
| | Store the bags in dry cool place for security or marketing | | | | |

**XN =Mean Needed, XP = Mean Performance, IN= Improvement Needed, INN=Improvement Not Needed**

The data presented in table two revealed that performance gap values of 12 out of 13 items ranged from 0.37 – 1.39 and were positive. This performance gap values indicated that improvement is needed in them by women in agriculture for processing cocoyam into flour for food security.

However table 3 further revealed that one of the items had its performance gap value as -0.38. This performance gap value indicated that women in agriculture did not need improvement in the competency item

**Research question 3**

What were the competency improvements needed by women in agriculture for processing cocoyam into chips for food security?

***Table 3***

***Performance Gap Analysis of the Mean Ratings of the Responses of Women in Agriculture for Processing Cocoyam into Chips for Food Security.***

***N= 362***

| S/N | ITEM STATEMENTS | XN | XP | (PG) XN-XP | Remarks |
|---|---|---|---|---|---|
| 1. | Determine the cocoyam variety that is most suitable for chips | 3.33 | 2.14 | 1.19 | IN |
| 2. | Purchase the variety of cocoyam for chips | 3.86 | 2.36 | 1.50 | IN |
| 3. | Remove hairs and dirt from cocoyam cormels with knife | 3.90 | 3.40 | 0.50 | IN |
| 4. | Wash with clean water | 3.68 | 3.05 | 0.63 | IN |
| 5. | Put in drum or big container and boil long enough to change colour | 3.72 | 2.17 | 1.55 | IN |
| 6. | Spread on a raised platform for cooling | 3.68 | 2.44 | 1.24 | IN |

| | | | | | |
|---|---|---|---|---|---|
| 7. | Peel the back | 3.39 | 2.43 | 0.96 | IN |
| 8. | Slice the cormel to 1mm thick into chips with knife/slicing machine | 3.83 | 2.69 | 1.14 | IN |
| 9. | Separate individual slice of cormel with separator | 3.75 | 3.23 | 0.52 | IN |
| 10. | Smoke the chips under the chimney for 4days until crispy | 3.76 | 2.34 | 1.42 | IN |
| 11. | Turn the chips under the chimney regularly for uniform drying | 3.47 | 2.39 | 1.08 | IN |
| 12. | Pack in air tight drums after drying | 3.90 | 2.77 | 1.13 | IN |
| 13. | Store the drums for use when required | 3.78 | 3.67 | 0.11 | IN |

**XN = Mean needed, XP = Mean performance, IN = Improvement needed**.

The data presented in table 3 revealed that the performance gap values of all the items range from 0.11 – 1.55 and were positive. This performance gap values indicated that improvement were needed by women in processing cocoyam into chips for food security.

**Research question 4**

What were the competency improvements in marketing needed by women in agriculture for processing cocoyam into flour and chips for food security?

***Table 4***

***Performance Gap Analysis of the Mean Ratings of the Responses of women in Agriculture in marketing needed for marketing Flour and Chips for Food Security.***

**N-362**

| S/N | ITEM STATEMENTS | XN | XP | (PG) XN-XP | Remarks |
|---|---|---|---|---|---|
| 1. | Grade the products according to quality | 3.31 | 2.66 | 0.65 | IN |
| 2. | Determine price for different grades of | 3.89 | 3.11 | 0.78 | IN |
| 3. | flour/chips | 3.88 | 2.43 | 1.45 | IN |
| 4. | Advertise for flour/chips produced for sale | | | | |
| | Determine means of supplying to the buyers for | 3.76 | 2.22 | 1.54 | IN |
| 5. | profit maximization | 3.70 | 3.01 | 0.69 | IN |
| 6. | Transport to the market for sale or deliver to | 2.98 | 2.11 | 0.87 | IN |
| 7. | buyers | | | | |
| | Maintain good public relationship | 2.88 | 2.10 | 0.78 | IN |
| | Reconcile sales with production cost to ascertain profit or loss | | | | |

**XN = Mean needed, XP = Mean performance, IN = Improvement need**

The data presented in table 4 revealed that the performance gap values of all the seven items ranged from 0.65 – 1.54 and were positive. This performance gap values indicated that

improvement were needed in marketing by women in agriculture for marketing flour and chips for food security.

**Discussion of Result**

The result of this study on competency improvement needs of women in agriculture in processing cocoyam into flour and chips were in consonance with the findings of Miller (2006) in a study on professional improvement needs of metalwork teachers in colleges of education in South Western Nigeria. The author found out that metalwork teachers needed improvement in 128 professional skills for better performance in teaching metalwork to students in colleges of education in the study area.

The result of this study were also in conformity with the findings of Abu (2008) who in a study on competency improvement needs of farmers in soil conservation found out that farmers required improvement in 316 competencies in soil conservation in Kogi State.

In agreement with the result of this study were the findings of Dibio (2008) in a study on requisite skills required by teachers of agriculture for improving the teaching of yam production to secondary school students in Enugu state. The author found out that 5 requisite skill modules with their corresponding 69 skill items were areas in yam production where teachers of agriculture required improvement for effective teaching in secondary schools in Enugu state.

**Conclusion/Recommendation**

This study has provided information on the areas in cocoyam processing into flour and chips where women in agriculture in South Eastern Nigeria needed improvement. These competency areas included 12 in planning, 13 in processing cocoyam into flour, 13 in processing cocoyam into chips and 7 in marketing flour and chips.

It was therefore recommended that the identified competencies in cocoyam processing where women in Agriculture indicated need for improvement be packaged into training programme to be utilized in training women in Agriculture through workshops and seminars. Co-operatives, government agencies, and relevant NGOs should help use the findings of this study to improve acquisition of competencies of women in cocoyam processing for food security in South-Eastern Nigeria

The competencies identified could also be packaged and integrated into the Agricultural Development Programme (ADP) women unit for training women in Agriculture With adequate facilities and affordable technologies.

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