

CAPACITY BUILDING NEEDS OF WOMEN FARMERS IN TOMATO PROCESSING ENTERPRISE IN BENUE STATE FOR NATIONAL DEVELOPMENT

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Abstract

The paper focused on capacity building needs of women farmers in tomato processing enterprise in Benue state for national development. Three research questions were developed and answered by the study. Descriptive survey research design was adopted for the study. The study was carried out in Benue State, which is made up of three Agricultural zones. Six Local Government Areas were used and 25 women farmers were selected from each Local Government Area giving a total of 150 respondents. There was no further sampling of the population because it is small and can be well managed. The instrument for data collection is a structured questionnaire made up of 62 items. The instrument was validated by three experts; one from the Department of Agricultural Education and two from the Department of crop production all from Federal University of Agriculture, Makurdi. Cronbach alpha reliability method was used to determine the internal consistency of the instrument which yielded a reliability coefficient of 0.89. 150 copies of the questionnaire were administered to the respondents by the researcher through personal contact with the help of two research assistants. All the copies of the questionnaire were answered and returned. The data collected were analysed using mean and improvement need index to determine the capacity building needs of women farmers in tomato processing enterprise in Benue State for national development. The difference between the needed mean and the performance mean (XN-XP) constituted the gap for capacity for which women farmers need capacity building. It was discovered that women farmers have limited knowledge in tomato processing and it was recommended that women farmers should be trained in various aspects of tomato processing enterprise, among others.

Keywords: Tomato processing, Women farmers, Capacity building, National development

Introduction

Tomato (*Solanum lycopersicum* L.) is a perennial plant but normally grown as an annual plant and it belongs to the botanical

family Solanaceae. It bears yellow flowers in clusters. The fruits are round to lobed and they vary in size and colour ranging from red, pink or yellow when ripe. Tomato has

given best results when grown in well-drained loams and is propagated by seed (Nicola, Tibaldi and Fontana 2005). Tomato is cultivated all over the world with china as the world's top grower and it is one among the most consumed vegetable especially when it is processed (Food and Agricultural Organization, 2008). In the opinion of Srinivasan (2010), tomato is one of the major grown vegetable in Benue State and it grows well and sell well during the production season but once out of season, it is always difficult to get tomato to use due to lack of adequate processing of tomato to enhance its longevity and availability in the market.

Tomato is use in a variety of ways. Ripe tomato can be consume fresh or processed into puree, paste, powder, ketchup (tomato sauce), sauce and soup while the unripe ones are pickled or used for preserves. Tomato extract is use as medicine for treating ulcer, haemorrhoids, wounds, kidney and liver problems in most part of the world and the fresh fruit aids digestion when eaten and it is a rich source of vitamins A and C (Nell and Wessels, 2006). The capacity building in processing tomato deals with making the quality of tomato better than they used to be after harvest through simple processing technology, preservation and storage, improved marketing strategies through information and communication technology (ICT) and this is why the government is encouraging farmers to increase national income through agriculture rather than depending on revenue from petroleum alone.

Tomato processing is the series of mechanical activities such as selection, disinfection, blanching, dehydration, pasteurization, sterilization among others carried out on harvested tomato fruits in order to make the paste marketable as raw materials for the industries (Longman, 2006). The advantages of processed tomato fruits are numerous which are: it enables out of season consumption, improves farm-household nutrition, improves storage capacities for tomatoes, longer storage periods than for fresh tomatoes, easier storage in bottles, jars, etc. can be stored more conveniently than fresh tomatoes, lower post-harvest losses of tomato crop, improves marketing of tomatoes by making them more convenient for buyers to use, provides an opportunity for labeling that will attract consumers and may provide a new taste for consumers(Hannah, 2009).

Tomatoes can be preserved inexpensively by using canning, freezing, or drying techniques. Modern-day food preservation methods, such as water-bath canning, help you preserve with ease. But the common processing method available to our women farmers is the drying method where ripe tomatoes are harvested, and sliced into different sizes and left under the sun to dry and it is always difficult to dry produce during the rainy season because the women farmers depend solely on sun drying and in this case there is need to enhance the women capacity in tomato processing (Srinivasan, 2010).

According to Longman (2006), a farmer is someone who owns or manages a farm that could be livestock or crop farming. In this study, a farmer is a female individual who owns or grows tomato for the benefit of mankind and to enhance their living standard. The 2007 census of agriculture revealed that women farmers cultivate more vegetables including tomato than male farmers do and the United Nations Food and Agriculture Organization (FAO, 2008) estimated that at least 80% of rural smallholder farmers worldwide are women. Women have always been active in producing food crops, processing food, and marketing food. As men leave the rural areas in search of better work prospects, women have taken over the traditional male roles in farming in their own capacity.

Capacity building is a process through which individuals, groups and organizations are empowered to meet development challenges (Catholic Relief Services, 2013). Capacity building is the process of developing and strengthening the skills, instincts, resources and ability that farmers need for them to survive, adapt and thrive in the fast changing world of technology through appropriate knowledge, skills, system, attitude and resources that will enable farmers especially the women farmer to be effective and efficient in processing of their farm produce (Ukonze, Eze and Olaitan, 2009). In the context of this study, capacity building involves determining the improvement needs of women farmers and influencing appropriate knowledge, skills, system, attitude and

resources that enable women to process tomato fruits more efficiently and effectively. The processing of tomato fruits into tomato paste involves the followings: selection, disinfection, blanching, dehydration, pasteurization of products, sterilization of jars and source containers, technology in processing for national development, preservation and storage, improve marketing strategies through information and communication technology ICT and ensuring improved exportation of processed tomato to different countries to increase foreign exchange earnings thereby bringing more collaboration and partnership of countries in the stock market for national development(Hannah, 2009).

The purpose of this study is to determine capacity building needs of women farmers in tomato processing enterprise in Benue State for national development. Specifically, the study sought to determine;

1. The capacity building needs in planning for tomato processing enterprise;
2. The step-by-step procedures for processing tomato fruits into tomato pastes;
3. Identify the strategies needed for marketing of processed tomato.

Research Questions

1. What are the capacity building needs of women farmers in planning for tomato processing enterprise?

2. What are the step-by-step procedures for processing tomato fruits into tomato pastes?
3. What are the strategies needed by women farmers for marketing of processed tomato?

Methodology

Three research questions guided the study. Descriptive survey research design was adopted for this study. Descriptive survey refers to the identification and measurement of some characteristics of a population or phenomenon under study. Eboh in Ukonze and Ejiofor (2013) defined descriptive survey as a study that entails the systematic collection of data to give a clear picture of a particular situation. Olaitan, Ali, Eyo and Sowande in Asogwa, Olaitan, and Asouzu, (2013) stated that survey research design is the plan, structure and strategy that the investigator wants to adopt in order to obtain solutions to research problems using questionnaire for collecting, analyzing and interpreting data from respondents. Descriptive survey research design is suitable for this study because data was collected from a sampled population of women farmers to determine whether capacity building is needed by them in tomato processing enterprise or not using a structured questionnaire.

The study was carried out in Benue state (food basket of the nation) which is made up of three Agricultural zones that is known with fertile soil. Most crops including tomato do very well in the state. The study is restricted to six local government areas

within the three Agricultural zones since they are identified as the major tomato producing area in Benue State.

The population for this study was 150 women farmers. 25 respondents each were purposively selected from the six Local Government Area which are the major tomato producing area in the state. The instrument for data collection was a structured questionnaire made up of 62 items. The questionnaire had two types of scale; performance and required scale. The performance scale of high performance, average performance, low performance and no performance while the required scale of highly require, averagely required, slightly required and not required with assigned values of 4, 3, 2 and 1 for the two groups of scales respectively. The instrument was validated by two experts, from the Department of Agricultural Education and one from the Department of Crop Production, University of Agriculture Makurdi to proffer suggestions for improving the instrument in meeting the purpose of the instrument for the study. The correction suggested was effected and integrated into the modified copy of the instrument used for data collection. Cronbach alpha reliability method was used to determine the internal consistency of the questionnaire items. A reliability coefficient of 0.89 was obtained, indicating that the instrument is reliable for the study. 150 copies of the structured questionnaires were distributed with the help of two research assistants and all were retrieved from the respondents.

Improvement Needed Index (INI) was used to answer the research questions to determine the performance gap and the capacity building needs of women processors, the following steps were taken;

- a) The weight mean of each item under the needed category which is XN was calculated.
- b) The weight mean of each item under the performance category which was XP was calculated.
- c) The difference between the two weight at means from each item $XN - XP$ was determined to give the performance gap (PG)
 - Where the difference PG was zero (0), there was no need for capacity building because the level at which the item was

needed as indicated by the weighted mean was equal to the level at which the women processor will perform that particular competency item.

- Where the difference was positive (+) for any item, there was need for capacity building because the level at which that item was needed was higher than the level at which the women processors will perform the competency item.
- Where the difference was negative (-) for any item, there was no need for capacity building because the level at which the competency item was needed was lower than the level at which the women processors could perform the competency item.

Research Questions

Research question 1

What are the capacity building needs in planning for tomato processing Enterprise?

Table 1: Need Performance Gap Analysis of mean Ratings of Responses of the respondents on Capacity Building Needs of Women Farmers in Planning for Tomato Processing Enterprise (N=150)

S/No	Item Statement	\bar{X}_N	\bar{X}_P	PG $(\bar{X}_N - \bar{X}_P)$	Remarks
1	Formulate specific objectives for tomato processing.	3.50	2.48	1.02	CBN
2	Review the objectives of tomato processing enterprise periodically	3.48	3.02	0.46	CBN
3	Decide on the location of the tomato processing enterprise	3.36	2.14	1.22	CBN
4	Draw up programme for the enterprise	3.42	2.51	0.91	CBN
5	Identify sources of fund for the enterprise	3.30	2.22	1.08	CBN
6	Identify relevant personnel to assist in the business	3.32	2.16	1.16	CBN
7	Training of personnel on task schedules	3.36	2.00	1.36	CBN

8	Provide relevant equipment for use in processing	3.38	2.60	0.78	CBN
9	Identify task to be performed at a relevant time	3.43	2.20	1.23	CBN
10	State processes and rules for the enterprise	3.45	2.12	1.33	CBN
11	Identify market outlet for processed tomato	3.47	2.30	1.17	CBN
12	Identify relevant records to keep for the business	3.51	2.60	0.91	CBN
13	Establish periods for tomato paste processing enterprise	3.36	2.70	0.66	CBN
14	Make budget for tomato fruits processing	3.46	2.50	0.96	CBN
15	Source for containers for packaging tomato	2.56	3.50	-0.94	CBNN
16	Washing the containers	2.30	3.51	-1.21	CBNN
17	Cleaning and drying containers	2.17	3.45	-1.28	CBNN
18	Source for labels	3.41	2.56	0.85	CBN

CBN = Capacity building needed and **CBNN**= Capacity building not needed

Table 1 revealed that 15 skills were needed where capacity building will improve the efficiency of the women tomato farmers. Items 1 to 14 and 18 are highly needed with a mean difference ranging from 0.91 to 1.4, while items 15 to 17 do not need any capacity building. Their mean difference is between -0.94 to -1.28.

Research Question 2

What are the steps by step methods for processing tomato fruits into processed tomato?

Table 2: Need Performance Gap Analysis of mean Ratings of Responses of the respondents on Steps by Step Methods for Processing Tomato Fruits into Processed Tomato (N=150)

S/No	Item Statement	\bar{X}_N	\bar{X}_P	PG $\bar{X}_N - \bar{X}_P$	Remarks
1	Source for tomato fruits to process from farm	2.60	3.31	-0.71	CBNN
2	Sort out spoiled tomato and discard them	2.71	3.42	-0.71	CBNN
3	Selection of tomato for the different phases of production	2.80	3.48	-0.68	CBNN
4	Washing the tomato fruits thoroughly	2.56	3.20	-0.64	CBNN
5	Disinfection of tomato fruits	3.01	2.15	0.86	CBN
6	Grade tomato fruits	3.21	2.20	1.01	CBN
7	Slice the tomato into sizeable bits	3.01	2.50	0.51	CBN
8	Blanch the tomato fruits	3.41	2.20	1.21	CBN
9	Grinding tomato fruits	3.01	3.45	-0.44	CBNN
10	Dehydrate tomato paste	3.35	2.40	0.95	CBN

11	Pasteurize tomato paste	3.42	3.01	0.41	CBN
12	Weigh process tomato	3.41	2.01	1.38	CBN
13	Sterilize container/jars	3.45	2.01	1.44	CBN
14	Pour paste into the sterilized jars/ containers	2.01	3.52	-1.41	CBNN
15	Arrange the containers in an autoclave and boil for 30-50 minutes depending on the weight of the jar.	3.56	2.55	1.01	CBN
16	Remove the containers and put them in fresh cold water to cool	2.06	3.41	-1.35	CBNN
17	Remove the container from the water to dry	2.40	3.32	-0.92	CBNN
18	Label the container and store	3.02	2.45	0.57	CBN
19	Drying of tomato	2.51	3.52	-1.09	CBNN
20	Concentration of tomatoes and transportation	3.52	2.05	1.47	CBN

CBN=Capacity building needed and **CBNN**= Capacity building not needed

Table 2 revealed that 11 skills are highly needed for capacity building of women farmers in the processing of tomato while 9 skills are possessed by the women which will not need capacity building. The needed capacity building skills have a mean rating of ranged from 0.41 to 1.47 while the not needed have a mean rating between -0.41 to -1.09

Research Question 3

What are the Skills needed for marketing processed tomato

Table 3: Need Performance Gap Analysis of mean Ratings of Responses of the respondents on Skills Needed by Women Farmers for Marketing Processed Tomato (N=150)

S/No	Item Statement	\bar{X}_N	\bar{X}_P	PG $(\bar{X}_N - \bar{X}_P)$	Remark
Skills for whole sale/ merchant					
1	Enroll as a member of cooperative society	3.52	2.31	1.21	CBN
2	Source for funds through union, banks and exporters	3.43	2.35	1.08	CBN
3	Establish/secure warehouse with facilities	3.46	2.30	1.16	CBN
4	Identify tomato country buying agents	3.22	2.10	1.12	CBN
5	Negotiate with tomato country buying agents to supply tomato	3.14	2.01	1.13	CBN
6	Identify tomato products with interest selling	3.23	2.05	1.18	CBN
7	Test products for quality control	3.11	2.11	1.00	CBN
8	Assist merchant in the inspection exercise for payment	3.15	1.55	2.60	CBN
9	Obtain payment for good delivered	3.37	2.70	0.67	CBN

10	Keep records of all transactions related to goods delivered to exporters Skills for exporting	3.25	2.51	0.74	CBN
11	Enroll as member of tomato promotion council	3.33	2.18	1.15	CBN
12	Secure a warehouse at the port with facilities for grading	3.40	2.56	0.84	CBN
13	Have a linkage with co-operative society to enable merchants supply tomato	3.43	2.10	1.33	CBNN
14	Inspect processed tomato for quality control	3.32	2.50	0.82	CBNN
15	Conduct nominated check test to confirm correct grading	3.36	2.44	0.92	CBNN
16	Pay the merchants for the goods delivered.	3.43	2.30	1.01	CBNN
17	Keep records for all transactions in respect of the business to determine level of profit or loss. Skills for retail/local farmers	3.37	2.36	1.10	CBN
18	Make market survey for tomato	3.38	2.51	0.87	CBN
19	Sort processed tomato into groups using size of bottles/containers/jars	2.51	3.06	-0.55	CBNN
20	Fix prices for each group	2.53	3.01	-0.48	CBNN
21	Advertise the product locally or through the media	3.43	2.53	0.90	CBN
22	Sell to buyers at the site or in the market	2.56	3.10	-0.54	CBNN
23	Keep appropriate record of sales	3.37	2.51	0.86	CBN
24	Calculate the expenditure and income to determine profit.	3.43	2.44	0.99	CBN

CBN=Capacity building needed and CBNN= Capacity building not needed

Table 3 revealed that 17 skills are highly needed for capacity building of women farmers for the marketing of processed tomato while 7 skills are already possessed by them in which no training is needed. The needed skills have a mean difference of between 0.67 to 1.33 while the not needed is between -0.48 to -0.55

Discussion of Results

Table 1 revealed that 15 skills were needed where capacity building will improve the efficiency of the women tomato farmers. Among the needed skills indicated are; formulation of specific objectives, periodic review of objectives, draw up of programmes for the enterprise, identify sources of fund for the enterprise among others. The findings from table 2 showed that 11 skills are needed for the step by step method of tomato

processing as the women farmers possessed some skills. The needed skills are; disinfection of tomato fruits, grading, blanching, dehydrating, pasteurizing, weighing of products, source for label among others. Table 3 showed that 17 skills are needed for marketing of processed tomato, the skills are; market survey for tomato, advertising of products, keeping of appropriate records, calculating expenditure and income to determine profit, test products for quality control, identify tomato country buying agents, negotiate with tomato buying agents, have a linkage with co-operative society to enable supply, enroll as a member of tomato promotion council, secure warehouse to keep products among others.

The results of this study were in agreement with those of Okeme, Ifeanyieze and Eze (2009) in a study; capacity building needs of teachers to measure achievement objectives of Agriculture science curriculum in secondary schools in Kogi state found out that teachers need capacity building to enable them set good quality objective questions in all the six levels of cognitive domain of learning and so required training. The findings of this study are in consonance with the study of Ukonze, Eze and Olaitan (2010) in a study of competency improvement needs of women in Agriculture in processing cocoyam into flour and chips for food security in South Eastern Nigeria. The study found out that women processors required improvement in processing enterprise as follows; planning competencies such as; formulate specific objectives for cocoyam processing business, review the objectives periodically to meet economic or business situation, decide on the location of the

cocoyam processing business and so on; competencies in processing cocoyam into chips such as; source for cocoyam tubers to process from market or locally from farmers, Peel cocoyam tuber to remove the cover using knife or machines and so on. competencies in marketing of processed cocoyam flour and chips such as; make market survey for cocoyam flour and chips, sort products into group using size of container, fix prices for each group, advertise the product locally or through the media and among others. The results of this study is also in agreement with the findings of Akwaji (2006), in a study carried out on work skills required by secondary school graduates for success in cassava processing enterprise in Cross River, where it was found out that 11 work skills were required in planning for cassava processing into chips. The skills included: decision on the type of farming practices to be adopted for growing, processing and marketing, identification of inputs for production among others.

The results of this study conforms with the findings of Asogwa, Olaitan and Asouzu (2013), in a study carried out on entrepreneurial skills required by women retirees for processing of pineapple fruits into juice as a sustainable business in Enugu State, Nigeria. It was found from the study that 9 skills were required for planning for pineapple fruit processing business. The skills include formulate specific objective for pineapple juice business, review the objectives periodically to meet economic or business situation, decide on the location of the pineapple justice business, draw up programme to cover different stages of

processing and so on. 16 skills in processing pineapple fruits into juice such as; source for pineapple fruit to process from market or locally from farmers, sort out spoiled pineapple fruit and discard them, wash the pineapple fruit thoroughly, peel pineapple fruit to remove the, cover using knife or machines, cut peeled pineapple fruit into small pieces and grind with grinder among others. 7 skills in marketing of pineapple juice. These skills include; make market survey for pineapple juice, sort juice into groups using size of bottles, fix prices for each group and so on.

The result is in agreement with the findings of the study of Asogwa, Olaitan and Asouzu (2010), on quality assurance of women in Agriculture in processing bambara groundnut into "Okpa" in Anambara State, where it was found out that women in Agriculture needed improvement in 23 competency items for processing bambara groundnut into "Okpa". These competencies include source for bambara groundnut pods to process from market or locally from farmers, sort out spoiled bambara groundnut pods and discard them, wash the pods thoroughly and dry in the sun or use machines, pour the dried pod in a grinder to blend to desired particle size and so on.

Conclusion

Tomato processing is the series of mechanical activities such as selection, disinfection, blanching, dehydration, pasteurization, sterilization among others carried out on harvested tomato fruits in order to make the paste marketable as raw materials for the industries. In Benue state, the researchers observed that the common

processing method available to women farmers is the drying method where ripe tomatoes are harvested, sliced into different sizes and left under the sun to dry. This makes it difficult to dry produce during the rainy season because the women farmers depend solely on sun drying hence, there is need to enhance the capacity of women farmers in tomato processing. This paper therefore determined the capacity building needs of women farmers in tomato processing enterprise for national development. The capacity building in processing tomato deals with making the quality of tomato better than they used to be after harvest through simple processing technology, preservation and storage, improved marketing strategies through information and communication technology (ICT) and this is why the government is encouraging farmers to increase national income through agriculture rather than depending on revenue from petroleum alone. The findings showed that the woman farmers needed improvement in various aspects of tomato processing enterprise, which includes effective planning, step - by - step processing and marketing of processed tomato.

Recommendations

From the study, the following recommendations were made;

1. The women tomato farmers should be organised into corporative in order to attract incentives, training and have an organised market for their produce.
2. Trainings in different areas of processing of tomato should be given to women farmers, this will enable them perform better than the crude method of drying

that they practice. The modernized way of processing will facilitate more sales and income thereby enhancing foreign exchange.

3. Extension agents should include the findings of this study into the training package of women farmers who engage in tomato processing enterprise in the state.
4. Extension agents should be prompt in training and follow up of the women tomato farmers to ensure that the necessary skills are imparted on the farmers.
5. The government of Benue state should encourage her women farmers by making funds available for the reach of farmers so as to enable them expand their production
6. The government should establish tomato processing industries in all agricultural zones in the state to serve as a processing and learning centres for women farmers.

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