



## WORK SKILL IMPROVEMENT NEEDS OF WOMEN FARMERS IN BITTER LEAF PRODUCTION FOR SUSTAINABLE INCOME IN ABAKALIKI, NIGERIA

<sup>1</sup>Eze, S. O. & <sup>2</sup>Adeyemi, HRY

<sup>1</sup>School of Agriculture and Environmental Sciences, University of the Gambia.

<sup>2</sup>Department of Physical and Natural Sciences, University of the Gambia.

### ABSTRACT

This study determined work skill improvement needs of women in agriculture in bitter leaf production for sustainable income in Abakaliki (Ebonyi North agriculture zone) of Ebonyi state Nigeria. The study made use of survey research design. Three research questions guided the study. The population for the study was 265 made up of 249 women farmers and 16 agricultural extension agents from Ebonyi state agricultural development programme (EBADEP) office, Abakaliki. The entire population was involved in the study. A 38 skill cluster questionnaire items was used for data collection. The instrument was validated by three experts. Split half technique was used to determine the internal consistency of the instrument. A reliability coefficient of 0.86 was obtained. Two hundred and sixty five copies of the instrument were administered on the respondents. Two hundred and fifty six copies were retrieved and analyzed using mean and improvement need index (INI) to answer the research questions. It was found out that the women farmers needed improvement in nursery preparation, pre planting operation, planting, post planting and post harvest operations in bitter leaf production. It was recommended among others that the identified work skills be packaged by extension agents to retrain women in agriculture for sustainable income in bitter leaf production.

**KEY WORDS:** skill, split-half technique, sustainable income.

### INTRODUCTION

The bitter leaf (*vernonia amydalina*) is an indigenous African plant species; which grows in most parts of sub-sahara Africa. Bitter leaf, is a leafy vegetable popularly known in most areas of West and East Africa. It grows everywhere in Africa, hence it is a homely plant. Bitter leaf is a shrub or small tree that can reach twenty three feet in height when fully grown. It has a grey or brown coloured, rough textured and flaked bark. The branches of the shrub are brittle and break off easily. The green leaves are oblong to lance- like in shape. They are veined and bear pale soft hairs on the underside. Bitter leaf bears small white flowers. These flowers bloom in cluster during dry season. The plant bears small fruits, which have slightly hairy small nuts inside. The parts used are the pith, leaf and root. Bitter leaf is eaten as a vegetable in many communities in Africa, and other places in the world; even animals use the plant to cure themselves. It is believed to ward off parasites and other intestinal parasitic infestations are treated by African people using the bitter leaf. The Igbos in Nigeria call it 'Olugbu', Yorubas call it 'Ewuro', Hausas call it 'Shuwaka', Cameroon calls it 'Bayingi' or 'Ndole', Tanzania calls it 'Mujonso', French calls it 'Vernonia' and the Gambians calls it 'Docta'.

Meara (1989) said that bitter leaf belong to a family of compositea. According to the Author, *Vernonia amygdalina*, *Vernonia lymenolepsiss*, *Vernonia colourata* and *Vernonia calvoana* are the species of bitter leaf usually grown in Africa. Nutritionally, Fube and Diona (2011) said that bitter leaf contains high quality of protein, iron, manganese and cellulose. Akinpale (1999), claimed that in Nigeria, bitter leaf is mostly used as a vegetable in Igbo land (Eastern Nigeria) while it is used more as a medicine in Yoruba land, (western Nigeria). Medicinally,

the Author submitted that bitter leaf is used in the following ways:

1. Application of undiluted extracts of bitter leaf juice to an affected part cures skin infections such as ringworm, itching, rashes and eczema.
2. The tender stem of the plant is used as a remedy for stomach aches when it is chewed and the bitter juice swallowed.
3. Extracted bitter leaf juice with a pinch of salt to three table spoons of the undiluted juice brings immediate relief of stomach aches when drunk.
4. It is used in curing diseases such as diabetes, loss of memory, prostate cancer, general weakness, stroke, pneumonia etc

Okon (2011) noted that bitter leaf is very useful in toning the vital organs of the body especially the liver and the kidney. Igile, Oleszek, Burden and Jurzysta (1995), wrote that soups and stews made from the green leaves of bitter leaf in many communities in West Africa help to restore human stamina. They added that bitter leaf extracts is used in producing beer in brewery industries. In the area of the study (Abakaliki, Ebonyi state) bitter leaf is consumed as a leafy vegetable and is produced mainly for this reason. In the area, bitter leaf ranks the most cherished and sort for vegetable crop because of its nutritive and medicinal value.

From biochemical perspectives, *V amygdalina* is well known as a medicinal plant with several uses attributed to treating diabetes, fever reduction, and recently a non-pharmaceutical solution to persistent fever, headache and joint pain associated with AIDS. The roots of the plant are of medicinal applications in treating giginvitis and headache due to its proven antimicrobial activity. Some species of the plant have been implicated as blood purifier

and uterus toners in women of productive ages (Crelin *et al.*; 1989) The sesquiterpene lactone composition of *A.amygdalina* implicates it in the prevention of atherosclerosis in man. Species widely grown in Ethiopia are reported to have oil contents of up to 41.9% and up to 80% vernolic acid used for paint formulation, coating plasticizers and reagents for many industrial chemicals. Extracts of *V amygdalina* is known to induce apoptosis, render cancerous cells more sensitive to chemotherapy, inhibit the growth of cancerous cells and in other cases suppress metastasis of cancerous cells in the body. Its ability to reduce estrogen levels in the body due to the ability of the extract to suppress aromatase activity reduces the progression of breast cancer in women (Izevbigie *et al.*; 2004) Being an antioxidant due to its composition of flavonoids, it is known to scavenge free radicals released during metabolism, thus preventing damages there from. The leaf extract of *V amygdalina* is known to enhance the immune systems through cytokines regulation. Recent works by Farombi and Owoeye (2011) implicated extracts of *V amygdalina* to be rich in phytochemicals like saponins alkaloids, terpenes, steroids, coumarins, flavonoids, phenolics, lignans, xanthenes, anthraquinones edotides and sesquiterpenes which elicit biological effects including cancer chemoprevention, among others.

Production of bitter leaf involves certain activities and stages. Erebor (1995) categorized activities in crop production to include nursery, pre-planting, planting, post planting and post harvest operations. In Nigeria especially in Ebonyi state, most of the operations mentioned above are carried out by women farmers to produce bitter leaf for their family uses. Women farmers or women in agriculture in the submission of Wikipedia (2009) are women who own farms and manage farming operations. These women according to Wikipedia engage in farming operations such as rearing of pigs, goats, poultry and growing of crops such as cassava, tomato, yam, cocoyam, and bitter leaf among others. With reference to this study, women farmers are female farmers who produce crops such as bitter leaf as an intercrop using low quality varieties which are obtained in the local markets. These women have no interest and are not even aware of methods to control pests and disease for the crop plant. They only harvest bitter leaf when there is need for family consumption and they sparsely make the surplus available for sale. All these affect the quality and quality of bitter leaf supplied for sale in the markets in the area. A focused interaction with bitter leaf marketers/ traders by the researcher revealed that the low supply of the products results in low distribution of bitter leaf to other cities and states in Nigeria, and that this had affected their income as well. This is an indication that bitter leaf has good market in the study area and that women farmers cannot experience loss if they produce more for the markets rather it will enhance their income and that of the marketers and distributors of the commodity. According to EBADEP Extension services department report on the activities of women in agriculture, a high percentage of the women farmers have shown interest to embark on commercial crop production such as bitter leaf if their work skills are improved. Masaaki (1986), explained improvement as a change for better or progress in development. Person (2006) stated

that improvement is the act of making something better. Improvement in the context of this study is the act of making the skills (ability to perform a task) possessed by women farmers in the area better for successful performance of specific tasks involved in bitter leaf production. If the work skills of these women farmers are improved, it is likely that they will be motivated to enhance their method of farming, harvesting and marketing strategies to strengthen their income for a sustainable living.

Therefore the purpose of this study is to determine the work skill improvement needs of women farmers in bitter leaf production for sustainable income in Abakaliki, (Ebonyi North agricultural zone) of Ebonyi state, Nigeria. Specifically, the study sought to determine the work skill improvement needs of women farmers in:

1. Nursery preparation
2. Pre-planting and planting operations in bitter leaf production and
3. Post planting and post harvest operations in bitter leaf production

#### METHODOLOGY

Three research questions guided the study. A survey research design was adopted for the study. Nworgu (2006) explained that a survey research design is one in which a group of people or items is studied by collecting data through interview or questionnaire and analyzing them. Therefore, the questionnaire was used to collect data for this study. The study was carried out in Abakaliki, (Ebonyi North agricultural zone ) Ebonyi state- Nigeria. The population for the study was 265 consisting of 249 women farmers and 16 agricultural extension agents. There was no sampling for the study due to the small and manageable size of the population; therefore the entire population was used in the study.

A 38-skill cluster item questionnaire was developed from literature reviewed and used for data collection. The questionnaire was divided into two components: skills needed and skills performed." The needed component had a 4 point response options of highly needed (HN), Averagely needed (An) slightly needed (SN) and not needed (NN) while the performance component had a 4-point response options of High performance (HP), Average performance (AP),, low performance (LP) and no performance (NP) with corresponding values of 4,3,2 and 1 respectively. The instrument was validated by three experts; one from Agricultural Education unit of the Department of technology and vocational education (TVE), Ebonyi state university, Abakaliki, another one from the department of crop science and the other one from the agricultural extension unit of Ebonyi state agricultural development programme. Their corrections and suggestions were used to develop the final copy of the questionnaire used for data collection. Cronbach Alpha reliability method was adapted to determine the internal consistency of the instrument. A reliability coefficient of 0.86 was obtained. Six research assistants that are familiar with the area of the study were trained on how to administer the questionnaire to the respondents. Two hundred and sixty-five copies of the questionnaire were administered to the women farmers and agricultural

extension agents. Two hundred and forty-nine copies of the questionnaire were retrieved and analyzed using weighted mean and improvement need index to answer the research questions.

The improvement needs of the women farmers were determined as follows:

- The weighted mean  $X_n$  of the needed response option for each item was calculated.
- The weighted mean  $X_p$  of the performance response option for each item was also calculated.
- The need gap (NG) was determined by calculating the difference between the values of  $X_n$  and  $X_p$  for each item. That is,  $NG = X_n - X_p$ .

When NG is zero (0), it means improvement is not needed because the level at which the women farmers could

**TABLE 1:** Need Gap Analysis of mean Ratings of the responses of respondents on work skills improvement need of women farmers in nursery preparation.

N=265 (249 women farmers and 16 extension agents)

S/N	Item statement	$X_n$	$X_p$	$X_n - X_p$ (NG)	Rmk
1	Select site for the bitter leaf nursery.	3.82	2.99	0.83	IN
2	Clear and stump vegetation to prepare the nursery bed.	3.79	2.66	1.13	IN
3	Demarcate the land with pegs.	3.92	3.00	0.92	IN
4	Loosen the soil to facilitate rooting	2.14	1.49	0.65	IN
5	Select healthy seeds.	3.85	3.07	0.78	IN
6	Mix selected seeds with adequate quantity of ash, sand soil or dry p manure	3.07	2.44	0.63	IN
7	Broadcast the treated seeds evenly on the soil	3.18	1.56	1.62	IN
8	Cover the seeds with thin layer of soil to prevent insect pests destroying the seeds	3.76	2.53	1.23	IN
9	Maintain farm hygiene in the nursery	3.20	2.13	1.07	IN
10	Prune seedlings when they have four to six leaves before transplanting	3.16	2.03	1.13	IN

$X_n$  = mean of needed;  $X_p$  = mean of performance, NG= Need Gap, N=number of respondents, IN= Improvement needed.

**TABLE 2:** Need Gap Analysis of Mean Ratings of the Responses of Respondents on work skills improvement need of women farmers in pre-planting and planting operations.

S/N	Item statement	$X_n$	$X_p$	$X_n - X_p$ (NG)	Rmk
1	<b>Pre-planting</b>	3.98	2.44	1.54	IN
	Select a suitable site for planting bitter leaf seedlings				
2	Survey the land for planting	3.33	1.88	1.45	IN
3	Clear trees and grasses on the land	3.75	2.45	1.30	IN
4	Fell trees and uproot their stumps	2.84	2.36	0.48	IN
5	Cut the felled trees into pieces for easy drying and removal	3.30	2.57	0.73	IN
6	Remove the debris of the cleared trees and grasses	3.85	2.30	1.55	IN
7	Divide the land into plots 6m x 4m	3.69	2.34	1.35	IN
8	Broadcast organic manure to increase soil fertility	3.96	1.28	2.68	IN
9	Till the soil to loosen it for easy rooting	3.86	2.32	1.54	IN
10	<b>Planting</b>	3.14	1.51	1.63	IN
	Irrigate the soil before and after transplanting.				
11	Select healthy seedlings for transplanting.	3.93	3.90	0.03	IN
12	Transplant seedlings to the field in the morning or late afternoon between 4-6 weeks of planting in the nursery	3.81	3.00	0.81	IN
13	Sow seedlings at a spacing of 30-40cm x 30-60cm	3.73	2.22	1.51	IN

$X_n$ =mean of needed ;  $X_p$  = mean of performance, NG =needed Gap; N= number of respondents; IN = improvement needed.

The data in table 1 revealed that the need gap (NG) values of all the ten (10) items ranged from 0.63 -1.62 and were positive. This indicated that women farmers needed improvement in the entire ten work skill cluster items in bitter leaf nursery in Abakaliki, Ebonyi State-Nigeria.

perform that item is equal to the level at which it was needed. Where NG is positive it means improvement was needed because the level at which the women could perform that item is lower than the level at which it was needed. Where NG is negative (-), it means improvement was needed because the level at which the women could perform that item was greater than the level at which it was needed. (Olaitan and Ndomi in Ellah, 2007)

## RESULTS

The results of the study were obtained from the research questions answered.

### Research Question 1

What are the work skills in bitter leaf nursery where women farmers needed improvement? The data for answering research question 1 are presented in table 1.

### Research Question 2

What are the work skills in pre-planting and planting operations in bitter leaf production where women farmers needed improvement? The data for answering research question 2 are presented in table 2.

The data in table 2 revealed that the need gap (NG) values

of all the thirteen (13) items ranged from 0.03-2.68 and were positive. This indicated that the women farmers needed improvement in the thirteen work skill cluster items on pre-planting and planting operations in bitter leaf production in Abakaliki agricultural zone of Ebonyi State.

**Research Question 3**

What are the work skills in post planting and post harvesting operations in bitter leaf production where

women farmers needed improvement? Data for answering research question 3 are presented in table 3.

The data presented in table 3 revealed that the need gap (NG) values of all the sixteen (16) items ranged from 0.10-1.63 and were positive. This indicated that women farmers in Abakaliki needed improvement in the entire sixteen work skill cluster items in post planting and post harvest operations in bitter leaf production.

**TABLE 3:** Need Gap Analysis of Mean Ratings of the responses of Respondents on work skills improvement need of women farmers in post planting and post harvest operations in bitter leaf production. N=265 (249 women in agriculture and 16 extension agents)

S/N	Item statement	Xn	Xp	Xn-XP (NG)	Rmk
1	Post planting. Irrigate the farm daily for four weeks after transplanting especially during season (Note: Seedlings are prone to draught).	3.90	3.00	0.90	IN
2	Weed vegetable garden regularly especially during the early State of development	3.96	3.35	0.61	IN
3	Apply poultry manure at a rate of 15 tone/ha alone or in combination with 400l of NPK 20-10-10.	3.33	2.69	0.67	
4	Apply wood ash or pesticide for pest control	3.41	2.36	1.05	IN
5	Control disease of bitter leaf through appropriate method (mechanical or biological)	3.89	3.79	0.10	IN
6	Earthen up the plants to strengthen their root systems	2.99	2.36	1.63	IN
7	Remove suckers to stimulate leaf production, larger leaf and more abundant foliage	2.74	1.21	1.53	IN
8	Cut the stem at 15-50cm from the ground after 4-5 weeks of transplanting for branches.	3.44	2.35	1.09	IN
9	Harvest bitter leaf at 14-21 days intervals.(2-3 weeks)	2.98	2.43	0.55	IN
10	Pick bitter leaves from the stem of the plant	3.94	3.11	0.84	IN
11	Post harvest Tie the leaves in bundle	4.00	3.82	0.18	IN
12	Store the bundles in a cool dry place in an upright position	3.63	2.60	1.04	IN
13	Sell to buyers at profitable price	3.60	2.42	1.18	IN
14	Sprinkle water on leaves to keep them fresh if not sold immediately	3.22	1.72	0.50	IN
15	Top or stool the plant in the farm every year to stimulate higher leaf production				
16	Replace the plants when they start aging by producing small quantity and sized leaves	3.91	3.44	0.47	IN

Xn=mean of needed ; Xp = mean of performance, NG =needed Gap; N= number of respondents; IN = improvement needed

**DISCUSSION**

The results of this study indicated that women farmers needed improvement in 10 works skills in nursery preparations, 13 work skills in pre-planting and planting and 16 work skills in post planting and post harvest operations in bitter leaf production in Abakaliki, Ebonyi State. The results of this study are in agreement with the findings of Asogwa, Olaitan and Asouzu (2010) in a study on quality assurance of women in agriculture in processing bambara groundnut into ‘Okpa’ in Anambra State where it was found out that the quality assurance of women in agriculture in processing bambara groundnut to ‘Okpa’ was average; and that the women needed improvement on competencies required in processing nuts into flour and preparing ‘okpa’ from flour.

The results of this study are in consonance with the findings of Asogwa, Dumbiri and Omeje (2010) in a study on competency improvement needs of Okra farmers for commercial production to enhance income in Enugu State, where it was found out that okra farmers in Enugu state needed capacity building in 10 competencies in planning, 16 competencies in pre-planting and planting operations and 10 competencies in post planting and post harvest operations of okra production in Enugu State.

The results are also in conformity with the findings of Olaitan, Asogwa and Asouzu (2010), in a study carried out on professional skill capacity building needs of teachers of Agriculture for effective teaching of vegetable production to students in Colleges of Education in South east Nigeria, where it was found out that teachers of agriculture needed capacity building in planning, implementing and evaluating instruction and nursery, pre-planting, planting, post-planting and post harvest operation for effective teaching of vegetable production to the students.

The findings of the authors cited above helped to strengthen the validity of the findings of this study.

**CONCLUSION**

The observation of the researchers revealed that women in Ebonyi State produce bitter leaf as an intercrop at a subsistence level which results in a lower output and supply than the market demand. The low level of production could be associated with the level of skills possessed by the women. The study found out that those women farmers in Abakaliki needed improvement in nursery preparation, pre-planting, planting, post planting and post harvest operations in bitter leaf production.

**RECOMMENDATIONS**

Based on the findings of the study, it was recommended that:

1. The identified work skills should be used by extension agents to retain women for improvement in bitter leaf production.
2. The identified work skills should be utilized by skill acquisition centers to teach secondary school graduates, retirees and those who may be interested in bitter leaf production for sustainable income.
3. Teachers of agriculture in secondary schools and instructors in schools of agriculture should use the identified work skills to train their students on in bitter leaf production.
4. The identified skills could be replicated for the production of other vegetable crops by schools and colleges including other farmers within and outside the state.

**REFERENCES**

Akinpelu D.A. (1999) Antimicrobial activity of Vernonia Amygdalina leaves Fitoterapoa. *The journal for the study of medical plants* Vol. 70 (4) pp.432.

Asogwa, V.C., Olaitan, S.O. and Asouzu, I. (2010) Quality assurance of women in Agriculture in processing bambara groundnut into 'Okpa' in Anambra state. *International journal of Educational Research, Faculty of Education, University of Nigeria, Nsukka* Vol.11, No:2, 2010.

Asogwa, V.C., Dumbiri, D.N. and Omeje, M.N. (2010) competency capacity building needs of Okra farmers for commercial production to enhance income in Enugu state. *Ebonyi technology and vocational education journal*. Vol.1 No 1, MAY,2010.

Crelin, J.K., Philpot, j. and Tommie Brass, A .L. (1989) A reference guide to medicinal plants; Herbal Medicine Past and Present. Duke University Press. 265.

Erebor, C. (1995) *Comprehensive Agricultural Science for senior secondary schools* Onitsha: Johnson publishing Company.

Farombi, E.O. & Owoeye, O. (2011) Antioxidative and Chemopreventive properties of *V amygdalina*. *Int. J. Environ. Res. Public Health*. 8(6) 2533-2555.

Febu, H.N and Djonga, B (2011), *Tropical Vegetables in Human nutrition. A case study of Ndole (Bitter leaf) Vernonia caalvoana (Hook) Cameroon*. ISHSA ta Horticulturae 198.

Igile, G.O, Oleszek, W., Burda, S. and Jurzysta, M. (1995) Nutritional Assessment of Vernonia amygdalina leaves in growing mice. *V. Agric. Food chem.* 43.2162-2166.

Isawumi, M. A. (1993) Vernonia hymenolepis A. Rich. Retrieved from [www. Prota.org](http://www.Prota.org) on 7/09/2011.

Izevbogie, E. B., Bryant, J. L., Walker, A. (2004) Natural inhibitors of extracellular signal-regulated kinases and human breast cancer cells. *Exp Biol & Medicine* 229:163-169.

Kokowaro. J.O (1993) *Medicinal Plants of East Africa*. 2<sup>nd</sup> Edition. Kenya Literature Bureau, Nairobi, Kenya 401pp.

Meara, B.O. (1989) *African Gardens and Orchards: growing vegetables and fruits*. London: Macmillan publishers.

Nwogu, B.G. (2006) *Educational Research; Basic Issues and methodology*. Ibadan: Windon publishers Ltd.

Okon, A. (2011) protect your vital organs with bitter leaves. Retrieved from [health guidance.com](http://healthguidance.com) on 13/08/2011.

Olaitan, S.O., Asogwa, V.C. and Asouzu, A. (2010) professional skills capacity building needs of teachers of Agriculture for effective teaching of vegetable production to students in colleges of education in South East Nigeria. A paper presented at the Annual conference of Nigeria Vocational Association (NVA2010), Universty of Nigeria Nsukka.

Schippers, R. R. (2000) *African indigenous vegetables: An overview of cultivated species*. Natural Resources Institute/ACP-Ell Technical Center for Agricultural and Rural Cooperation, Chatham United Kingdom. 214PP.

Wikipedia, (2011) Bitter leaf. Retrieved from [http:// en.wikipedia.org/ bitter leaf](http://en.wikipedia.org/bitterleaf) on 28/08/11.