



Work Skills Improvement Needs of Farmers in Pawpaw Production and Marketing for Sustainable Livelihood in Delta State

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ABSTRACT

The study was set up to determine the work skill improvement needs of farmers in pawpaw production and marketing for sustainable livelihood in Delta State. The study adopted survey research design. Three research questions guided the study. The population of study consisted of farmers and agricultural education lecturers from Federal College of Education, Asaba. A sample of 95 respondents was selected as sample of the study. A 30 work skill cluster questionnaire was used for the study and data collected were analysed using mean and Improvement Need Index (INI). The result revealed that the farmers needed work skills improvement in 8 nursery, 10 establishments and management and 10 harvesting and marketing skills of pawpaw production for sustainable livelihood in Delta State. The study recommended that the identified skills should be used to retrain farmers by extension agents and vocational centres in Delta State. The government should encourage farmers to into pawpaw production by providing incentives such as fertilizer, improved seeds, loan among others.

INTRODUCTION

Pawpaw (*Carica papaya*), a flowering plant, belongs to the family Caricaceae, which include about 20-25 species of short-lived evergreen shrubs or small trees growing to 5-10 m tall. Pawpaw tree is fast – growing and prolific in nature; it produces its first fruit in 10 -14 months from germination, taking about 5 months to develop. Pawpaw originated from Southern Mexico, Central America and South America. It is also cultivated in most countries with tropical climate, such as Brazil, India, South Africa, Nigeria, Haiti and South East Asia (Anon, 2010). The ripe fruit is usually eaten raw, without the skin or seed, because of its high sugar content.

Nutritionally, Somsri and Bussabakoruku (2007) stated that pawpaw fruit consists mainly of water and carbohydrate, low in calories, rich in vitamins A, C, ascorbic acid and minerals such as potassium. Pawpaw is consumed as fruit vegetable, jams pickles or desserts. The author further stated that unripe pawpaw fruit is used in cooking; cooked as a vegetable; it fermented into sauerkraut or candied. Medically, Martinez (2011) stated that pawpaw fruit has been used as an ethnomedicine for centuries. Ripe pawpaw is an effective medicine for ringworm, due to its anthelmintic properties. The unripe green fruit is an aphrodisiac and lowers blood pressure. Its gummy milk sap kills parasite, controls termite, kills worm and serves as a de – wormer because of its purgative actions. The author continued that the green leaves have protective properties against malaria; when steamed and eaten like a vegetable serves as a heart tonic, analgesic and treats stomach-ache. Amer, Goldfarb, Rachmilewitz and Fibach (2008) clarified that antioxidants in pawpaw prevents a number of health conditions such as cardiovascular diseases, aging, cancer, atherosclerosis and diabetic heart diseases. Eating ripe pawpaw helps to maintain the levels of blood glucose, and ensures a steady supply of glucose and high levels of energy all day.

Emeruwa (1982) stated that pawpaw fruit and its extracts have produced bactericidal activity against *staphylococcus aureus*, *Bacillus cereus*, *Eschanchia coli*, *Pseudomonas aeruginosa* and *shigella Flexneri*. In Delta State, pawpaw is consumed as a fruit vegetable; the leaves are used against malaria and the stems are used as feed for pigs. For this reasons, pawpaw has market in the locality and could engage farmers for sustenance.

A farmer in the opinion of Iwena (2008) is a person who grows plants or rears animals for the benefit of mankind. It is an individual who owns or manages a crop or an animal farm. In this study, a farmer is an individual who owns or grows pawpaw for the benefit of mankind and to enhance their living standard. Pawpaw farmers can gain and sustain their livelihood if they are trained on their needs on pawpaw production. When their needs are identified and they are trained on it, the work skills of the famers in pawpaw production will be improved.

Nwokoye (2016) defined improvement as the act of making something better. Improvement in this study refers to work skills possessed by farmers to better the production of pawpaw in Delta State. On the hand, Okon (2003) defined work skill as the human capability to technical work efficiency and competency while Osinem and Nwoji (2005) see work skill as the ability to perform an act efficiently.

Production as explained by Jhington (2003) is the rational combination of various input resources in order to create a stipulated output. It is the process of creating an output and making it get to the final consumers. Iwena (2008) referred to production as all economic activities which result in the creation of goods and services to certify human wants. Anyamouocha (2001) asserted that production is only said to be completed when the product gets to the final consumers. Ereboh (1995) categorized activities in crop production into preplanting, planting, post planting and harvesting operations. Therefore, pawpaw production is the combination of resource inputs for the purpose of obtaining pawpaw pods as outputs and making them available to the final consumers. The activities in pawpaw production are grouped into nursery, establishment and management of paw orchard and marketing of pawpaw pods.

Nursery is explained by Bridaine (1989) as a house or place where young plants know as seedlings are raised. It is an enclosure such as polypots, seed boxes or beds where seeds are raised into seedlings and protected from harsh weather before they are transplanted to the main farm. Asogwa (2013) observed that seedlings in the nursery are easily protected from weeds, pests and disease attacks. They grow faster due to effective utilization of fertilizers and protection from adverse weather conditions at this delicate stage of the plant. The author added that good nursery practices facilitate survival and establishment of seedlings in the farm after transplanting which makes their management easier for crop farmers.

Management, in the submission of Osinem (2008) is the coordination of all resources through the process of planning, organising, directing and controlling in order to attain stated objectives. Miriam (2013) viewed management as the judicious use of means to accomplish an end. It is the act of coordinating people's effort to achieve desired goals and objectives using available resources efficiently and effectively. In this context, management is the coordination of human effort and other relevant resources involved in pawpaw production and marketing of its pods for economic benefits.

Marketing is a means through which products are made available and sold to buyers at an agreed price. Hoyt (1995) referred to marketing as the various activities by which products are supplied, advertised and sold to the consumers. Andrew (2007) stated that agricultural marketing covers the services involved in moving an agricultural product from the farm to the consumer. It includes numerous interconnected activities such as planning production, growing and harvesting, grading, packing, transport, storage, agro- and food processing, distribution, advertising and sale of farm produce. Iwena (2008) explained that marketing of agricultural products does not only involve the disposal of agricultural produce to consumers but also the purchasing of farm inputs such as seeds, fertilizers, piglets and so on. George (2008) maintained that marketing is the most critical consideration in a crop production enterprise. The author cautioned that growers should not grow what they cannot sell, since horticultural crops are highly perishable. Marketing, in this study, involves all the activities in sourcing, grading, packing, transport, storage, distribution, advertising and selling of pawpaw pods to consumers or wholesalers. The nutritional values and perishable nature of pawpaw makes its production and marketing a means of sustainable livelihood for farmers.

The researcher observed that there is no evidence on available literature that competencies in pawpaw production and marketing have been identified. Also, a visit by the researchers to skill acquisition centres revealed that there is no identified skill packaged programme in pawpaw production and marketing for training of farmers in the state. The study therefore seeks to determine work skill improvement needs of farmers in pawpaw production and marketing for sustainable livelihood in Delta State.

Objectives of the Study

The purpose of this study is to determine work skill improvement needs of farmers in pawpaw production and marketing for sustainable livelihood in Delta State. Specifically, the study sought to determine work skill improvement needs of farmers in:

1. pawpaw nursery
2. establishment and management of pawpaw orchard
3. harvesting and marketing of pawpaw pods.

Research Questions

The following research questions guided the study:

1. What are the work skill improvement needs of farmers in pawpaw nursery?
2. What are the work skill improvement needs of farmers for the establishment and management of pawpaw orchard?
3. What are the work skill improvement needs of farmers in harvesting and marketing of pawpaw pods?

METHODOLOGY

The study adopts questionnaire survey research design. This design was considered suitable because the opinion of a representative sample of respondents was sought using questionnaire and the finding was generalized on the entire population of farmers and lecturers in Delta State. The population of study consisted of farmers and agricultural education lecturers from Federal College of education, Asaba.

Purposive and random sampling technique was used to select 30 pawpaw farmers from each of the three senatorial districts in Delta State. Five Agricultural education lecturers were randomly selected from Federal College of education, Asaba. This selection resulted to 95 respondents which were used as sample of the study.

The instrument for data collection was 30-item questionnaire titled: Work Skill Improvement Needs in Pawpaw Production and Marketing Questionnaire (WSINPPMCQ). The questionnaire was developed from literature and industries by the researchers and used for data collection. The needed skills was assigned four point response option of highly needed, averagely needed (3) slightly needed (2), and not needed (1) while skills performed component was assigned four point response scale of high performance (HP), average performance (AV), low performance (LP) and no performance (NP) with corresponding values of 4, 3, 2, and 1 respectively. The agricultural science lecturers responded to the skill needed component while the pawpaw farmers responded to the performed skill component.

The instrument was face – validated by three university lecturers: two from Department of Agricultural Education, Delta State University, Abraka. Their corrections and suggestions were utilized to improve the initial copies of the questionnaire to produce the final copies. Split half technique and Cronbach Alpha reliability method were adopted to determine the internal consistency of the questionnaire items. A Cronbach Alpha coefficient of 0.86 was obtained. Ninety copies out of Ninety five were retrieved and distribution. Weighted mean and improvement need index (INI) was used to answer the research questions

To determine the improvement need of work skill improvement needs of farmers in pawpaw production and marketing, the procedure set up by Olaitan and Ndomi (2000) was followed:

- the weighted mean of each item skills needed component (x) was calculated
- the weighted mean of each item under the skills performed component (x) was calculated
- the difference between the two weighted means for each items ($X_n - X_p = NG$) was also calculated for each item

Decision Rule

- Where the difference (NG) was zero (0), there was no need for improvement because the level at which the skill is needed was equal to the level at which the pawpaw farmer could perform
- Where the difference (NG) was negative (-) for any item it implies that improvement was not needed because the level at which the skill was needed was lower than the level at which the farmers could perform the skill
- Where the (NG) was positive for any item, it means that improvement was needed because the level at which the skill item was needed was higher than the level at which the pawpaw farmers could perform the skill.

RESULTS

Research Question 1

What are the work skill improvement needs of farmers in pawpaw nursery?

Table 1: Need gap analysis of mean ratings of work skill improvement needs of farmers in pawpaw nursery (N=90)

S/N	Statement items	Xn	Xp	Xn – Xp	Remark
	Ability to:				
1	Select site with vegetation shed and free from flooding.	3.51	3.45	0.06	IN
2	Clear and remove vegetation from the site	3.03	2.92	0.11	IN
3	Mark out the site in rows leaving a space of 2m in between them.	3.72	3.58	0.14	IN
4	Provide material inputs such as baskets, poly bags or trays, garden soil, river sand, organic manure, hoe or shovel.	3.54	3.44	0.10	IN
5	Mix garden soil, river sand and organic manure in the ratio of 3:2:1 thoroughly with shovel	3.51	3.11	0.40	IN
6	Fill the available container (basket, poly bag or tray) with the mixture.	3.50	2.91	0.58	IN
7	Water the container with its content daily to make the mixture wet	3.81	3.98	-0.11	INN
8	Mix the slurry of sand with water to separate good speeds from bad ones.	3.08	2.08	1.00	IN
9	Water the container with its content every other day.	3.72	3.78	0.06	IN
10	Observe seeds for germination after 2 weeks of planting.	3.71	2.81	0.90	IN

Where: Xn= mean of needed; Xp= mean of performance; NG=Need Gap; n=number of respondents; IN=Improvement needed

The result in Table 1 showed that 9 out 10 skill items on pawpaw nursery needed improvement on the way farmer carry out the work skills. The needed gap mean ranged from 0.06 – 1.00.

Research Question 2

What are the work skill improvement needs of farmers for the establishment and management of pawpaw orchard?

Table 2: Need gap analysis of mean ratings of work skill improvement needs of farmers in the establishment and management of pawpaw orchard (N=90)

S/N	Statement items	Xn	Xp	Xn – Xp	Remark
	Ability to:				
1	Select pawpaw orchard site of well drained soil (preferably loam soil) and free from water logging	3.71	3.07	0.64	IN
2	Survey the land for proper demarcation.	3.93	2.02	1.91	IN
3	Clear the vegetation and remove the debris and stumps.	3.62	3.58	0.04	IN
4	Mark the site in rows using pegs and leaving a space of 4m after planting 10 rows to allow for movement of equipment.	3.88	3.24	0.64	IN
5	Make holes of 15cm – 20cm deep and 2x2m spacing (ie between 2 holes).	3.11	2.71	0.40	IN
6	Transplant 1 or 2 seedlings per hole when using a dioecious variety to ensure a high female survival	3.70	2.91	0.79	IN
7	Water the orchard if rain has not stabilized.	3.81	3.28	0.53	IN
8	Apply 50g of NPK 15 -15 -15 per plant / hole 3 weeks after planting (based in soil test).	3.98	2.08	1.90	IN
9	Weed the orchard manually with hoe or cutlass or chemically using herbicide paraquat glyphosate at 4 – 6 or 3kg active ingredient per hectare at monthly interval depending on the fertility of the soil.	3.02	3.78	0.76	IN
10	Harvest mature pawpaw pods at ‘blush stage’ using colour change.	3.01	2.81	0.20	IN

Where: Xn= mean of needed; Xp= mean of performance; NG=Need Gap; n=number of respondents; IN=Improvement needed

The result in Table 2 indicated the 10 identified skill items on the establishment and management of pawpaw orchard needed improvement on the way farmer carry out the work skills. The needed gap mean ranged from 0.20 – 1.90.

Research Question 3

What are the work skill improvement needs of farmers in harvesting and marketing of pawpaw pods?

Table 3: Need gap analysis of mean ratings of work skill improvement needs of farmers in harvesting and marketing of pawpaw pods (N=90)

S/N	Statement items	Xn	Xp	Xn – Xp	Remark
Skills in Harvesting					
Ability to:					
1	Determine at what stage of maturity to harvest pawpaw pods based on the market channel.	3.71	2.07	1.64	IN
2	Move round the orchard to identify mature pods using colour change from green to light green, tinge of yellow or red at the apical end depending on the variety.	3.45	2.02	1.43	IN
3	Pick pawpaw pods by holding it in the palm and twisting it to cut the fruit stalk.	3.92	3.18	0.74	IN
4	Pick pawpaw pods by holding it in the palm and twisting it to cut the fruit stalk.	3.88	3.24	0.64	IN
Skills in Marketing					
5	Sort and grade pawpaw pods using sizes, colour and variety.	3.11	2.71	0.40	IN
6	Fix appropriate prices for each grade based on market survey or demand.	3.20	2.91	0.29	IN
7	Advertise pawpaw pods locally or through the media to attract buyers.	3.91	3.28	0.63	IN
8	Sell pods direct to buyers at the orchard gate or transport the pods to market for sale at better price.	3.78	2.68	1.90	IN
9	Keep appropriate records of sales for sustainability and/or expansion.	3.92	3.68	1.10	IN
10	Calculate the expenditure and income to balance the profit or loss account.	3.81	2.91	0.90	IN

Where: Xn= mean of needed; Xp= mean of performance; NG=Need Gap; n=number of respondents; IN=Improvement needed

The result in Table 3 indicated the 10 identified skill items on the harvesting and marketing of pawpaw pods needed improvement on the way farmer carry out the work skills. The needed gap mean ranged from 0.20 – 1.90.

DISCUSSION OF THE FINDINGS

Work skill improvement needs of farmers in pawpaw nursery

The result in Table 1 indicated that the farmers needed retraining amongst others in selecting site with vegetation and free from flooding, clear and remove vegetation from the site, proving material input such as polybag garden, organic manure; observing seeds germinate. This result is in consonance with the findings of Asogwa, Uko and Omeh (2010) that teachers in oil production posses the following skills: select site for the oil palm nursery, mark out the land with pegs, provide polythene bags, perforate the

polythene bags at the bottom to drain out water among others. Ukonze (2010) also found out that clearing the site ready for tillage, marking out the tilled land for beds, maintaining farm hygiene and providing shade are important skills in nursery operation for vegetable crops production in Enugu State.

Work skill improvement needs of farmers for the establishment and management of pawpaw orchard

The result in Table 2 showed that needed to be retrained in 10 skill items in establishment and management of pawpaw orchard. The findings was in consonance with the findings of Olaitan, Alawa Ekong (2009) in their study on capacity building of farmers in improving soil nutrients for enhancing crop production in Cross River, Nigeria, The authors found out that farmers required capacity building on 58 skills areas in soil testing and analysis, manuring and fertilizer application in improving soil nutrients to enhance crop production. The findings was in consonance with Okorie (1985) that the steps in sowing of seeds in the garden include: dig the soil to specification, rake the soil to give a fine tilth, remove any weed, plant the seeds and cover the seeds with soil from a fine sieve

Work skill improvement needs of farmers in harvesting and marketing of pawpaw pods

The result in Table 3 indicated that the farmers needed to be retrained in 10 skill items in harvesting and marketing of pawpaw pods. The result is in line with the findings of Olaitan, Asogwa and Eze (2010) that skills in marketing of vegetable products include: cleaning vegetable products of soil, sort and grade vegetable products, store, advertise and sell the products and keep appropriate records of expenses and sales. Omeje and Asogwa (2013) found out that skills in marketing of melon seeds include: survey the market for demand of melon products, fix prices for melon per-kilogram weight, identify distributing channels, advertise melon seeds to buyers, sell melon seeds to buyer at farm site or at the market and keep sales record to calculate profit or loss for melon production. Also, Dumbiri and Omeje (2010) in a study on competency improvement need 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 planning, 16 competencies in pre-planting and 10 competencies in post planting and post harvesting in Enugu State.

CONCLUSION

Pawpaw is a fruit vegetable highly consumed by households in Delta State because of its nutritive and medical values. This made its demand higher than its supply in the market. Hence, pawpaw production is lucrative and bankable such that farmers enter to gain occupation safely. The study found out that farmer needs to be retained 29 skills to enhance commercial pawpaw production for sustainable livelihood.

RECOMMENDATIONS

1. The identified skills should be used to retrain farmers by extension agents and vocational centres in Delta State
2. The government should encourage farmers to into pawpaw production by providing incentives such as fertilizer, improved seeds, loan among others.

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