Academic Journal of Agricultural and Horticultural Research
Vol.1, No.2; April-June-2021;
ISSN (5201 – 3992);
p –ISSN 7239 - 4203
Impact factor: 0.00

DEVELOPMENT OF ENTREPRENEURIAL SKILLS MODULE IN GINGER (*ZINGIBER OFFICINALE*) PRODUCTION FOR THE TRAINING OF SECONDARY SCHOOL LEAVERS IN NASARAWA STATE

[1]Agbo, T.O.O., [1]Yakubu, P. K. & [2]Ayang, A.F.
[1]Department of Agricultural Education, University of Agriculture, Makurdi, Benue State, Nigeria.
[2]Department of Agricultural Education, Federal College of Education, Obudu, Cross River State, Nigeria.
Corresponding Author: Dr T. O. O. Agbo

Abstract: Development of entrepreneurial skill training module in ginger production is a research study that tends to tackle the problem of mass unemployment in Wamba Local Government Area of Nasarawa State. The target population was all Senior Secondary School (SSS) III students in Wamba Local Government Area. The study sort to develop skills module for training of secondary school leavers in seven clusters of husbandry practices viz: Planning, pre-planting, planting, field maintenance operations, harvesting, processing of ginger and marketing of ginger products. Survey research design was adopted for this study. A 61-item structured questionnaire used to elicit responses from 129 respondents who were in SSS III. The questionnaire was divided into seven sections based on the research questions. Each of the skills item has a 4-points response scale of highly needed (HN), moderately needed (MN), slightly needed (SN) and not needed (NN) with a corresponding value of 4, 3, 2, and 1 respectively. The questionnaire was validated by two (2) experts from Departments of Crop Production and Agricultural Extension, University of Agriculture, Makurdi. Data obtained from the trial testing on 20 students in Makurdi, was analyzed using the Crunbach Alpha reliability method with a coefficient of 0.87. Mean and standard deviation were used to answer the research questions. Findings emerging from the study revealed all the skill items in planning, pre-planting, planting, field maintenance operations, and harvesting, processing and marketing operations respectively, were needed for training of secondary school leavers. The researchers therefore, recommended that the training module developed should be used as a workshop guide for secondary school leavers and others who may be interested in Ginger farming, by schools, skill acquisition centers, extension agents and government departments of agriculture. This will go a long way to curb social vices engaged in by youths like thuggery, gangstarism, armed robbery, prostitution, and drug related crimes.

Keywords: Entrepreneurial Skills, Ginger, Zingiber Officinale, Training, Secondary School Leavers

Introduction

Ginger (*Zingiber Officinale*) is a tropical monocotyledon and herbaceous perennial specie belonging to the order *Scitamineae* and family *Zingiberaceae*. It is the oldest rhizome widely domesticated as a spice. Ginger is a plant with leafy shoots, finger-like perennial underground part or rhizomes called hands and grows to a height of about 1.5 *m* with an aerial part as high as 0.8 *m* depending on cultivars and growing environment (Entrepinoys, 2010).

The cultivation of ginger commenced in Nigeria in 1927 and the locations include Southern Zaria, Jemma Federated districts and neighboring parts of Plateau but today, ginger is cultivated nationwide (Okwuowulu, 1997). Ginger grows well in the rainforest region of the country where rainfall is above 2000 *mm* and altitudes ranging from 0 - 800 meters above sea level within a temperature range of 25 0C – 35 0C (NRCRI 2005). It can be grown on sandy loam and clay loam soil with good drainages and a lot of organic matter. Ginger is popular for its distinct sharp and hot flavor due to an oily substance called *gingerol*. The rhizome is ready for harvesting and dug up when all the leaves and stems of the plant wither, which occurs between 6 and 12 months after planting. Harvesting of ginger starts from October and normally continues until April/May, depending on market situation as ginger can be left on the ground (not harvested) for two years. Ginger is in three (3) forms namely: fresh or green ginger, whole dry ginger and split dry ginger. The fresh or green ginger refers to the newly harvested ginger with little or no loss in moisture content. Traditionally, ginger is used in Nigeria for both medicinal and culinary (kitchen) purposes as well as in confectionery industry.

Ginger is a spice and medicinal plant gaining attention in the pharmaceutical, food and chemical industries. A remarkable increase in the use of medicinal plant products has been observed in the past decade. The economic value of ginger centers on its uses in the preparation of medicines, foods and in the manufacturing of beverages, pharmaceuticals and perms. In foods, ginger is used to flavor bread, cakes, biscuits, sausages and cookies. It is also blended with other spices for household uses. Ginger ale, ginger beer and ginger tea are among the beverages produced with it.

On the domestic scene, ginger is gaining acceptance as a flavoring agent competing favorably with curry and magi cube in this regard. It is becoming popular with "suya" (roasted meat) industry. Moreover, the production of ginger can serve as a source of employment to a very high percentage of Secondary School leavers in the country.

Agricultural Education is very important to the life of an individual as well as national development and growth. The present trend of mass unemployment in Nigeria shows that Vocational Education (Agricultural Education inclusive) being taught in the Secondary School level do not prepare the Secondary School leavers to function well in the society. It is expected that Secondary School leavers should posses vocational skills that will enable them function well in the society (being self employed), but it is obvious that these Secondary School leavers who are unable to secure admission into higher institutions immediately after graduation becomes liabilities to their parents, depending on their parents to provide all of their needs. The researcher visited the Agricultural Extension office of Wamba Local Government, and it was discovered that the extension office of the local government has training manuals on other crops such as yam, cassava, maize and groundnut, but there is no training manual on ginger production for the training of farmers. There are so many youths who are jobless. You see them every day on the streets playing cards from morning till evening under the shade and counting passing vehicles and wishing when they will get theirs. As a result of joblessness most youth resort to social vices such as armed robbery, thuggery, gangstarism, prostitution, and drug trafficking. This situation leads to waste of human resources which could be harnessed through the acquisition of entrepreneurial skills in ginger production. The growing number of unemployed youth and the absence of entrepreneurial skills training module in ginger production in the extension office necessitated the need for the study.

Academic Journal of Agricultural and Horticultural Research
Vol.1, No.2; April-June-2021;
ISSN (5201 – 3992);
p –ISSN 7239 - 4203
Impact factor: 0.00

Purpose of Study

The purpose of this study is to develop an entrepreneurial skill training module in ginger production for training Secondary School leavers in Nasarawa State. Specifically the study seeks to develop skills module for training of Secondary School leavers in the following clusters of husbandry practices:

1. Planning for ginger production.
2. Pre-planting operations.
3. Planting operations.
4. Field maintenance operations.
5. Harvesting operations.
6. Processing of ginger products.
7. Marketing of ginger products.

Research Questions

The research intends to answer the following questions:

1. What are the entrepreneurial skills needed by Secondary School leavers in planning for ginger production.
2. What are the entrepreneurial skills needed by Secondary School leavers in pre-planting operations in ginger production.
3. What are the entrepreneurial skills needed by Secondary School leavers in planting operations in ginger production.
4. What are the entrepreneurial skills needed by Secondary School leavers in field maintenance operations in ginger production.
5. What are the entrepreneurial skills needed by Secondary School leavers in harvesting operations in ginger production.
6. What are the entrepreneurial skills needed by Secondary School leavers in processing of ginger products.
7. What are the entrepreneurial skills needed by Secondary School leavers in marketing of ginger products.

METHODOLOGY

The study adopted the survey research design. This is because the study is aimed at introducing new or modified content, produce or instrument of educational practice used for training of Secondary School leavers in ginger production.

The population of the study was all the SSS III students offering crop production in Senior Secondary Schools in Wamba Local Government Area of Nasarawa State. Ten (10) schools were randomly selected from the 19 schools in the study area. All the 129 students in the 10 schools were used for the study; hence there was no further sampling. This comprised of 73 males and 56 females.

The instrument used for data collection was a 61-item structured questionnaire which obtained demographic information and entrepreneurial skills needed for success in ginger production enterprise. The skill section consist of items on planning operation skills, pre-planting operation skills, planting operation skills, field maintenance operation skills, harvesting operation skills, processing operation skills and marketing operation skills. Each of the skill items had a 4-point response scale of Highly Needed (HN), Moderately Needed (MN), Slightly Needed (SN) and Not Needed (NN) with corresponding values of 4, 3, 2, and 1 respectively.

The data was collected by the researchers who instructed the respondents on what to do. One hundred and twenty nine copies of the questionnaire were given out. All were returned and used for the study.

Mean and standard deviation were used to answer the research questions. All the items with mean value of 2.5 and above were accepted as needed for ginger production while those below 2.5 were rejected. The standard (2.5)

Academic Journal of Agricultural and Horticultural Research
Vol.1, No.2; April-June-2021;
ISSN (5201 – 3992);
p –ISSN 7239 - 4203
Impact factor: 0.00

was based on the average of the sum of the values of the scale.

Research Question 1:
What are the entrepreneurial skills needed by Secondary School leavers in planning for ginger production?

Results and Discussions

Table 1: Mean responses of Secondary School leavers on entrepreneurial skills in planning for ginger production.

S/N	Items	Mean	Standard deviation	Decision
1.	Identify source of funding for ginger production.	3.13	.944	Required
2.	Select site with fertile soil for ginger production.	3.11	.935	Required
3.	Select site with good drainage.	3.20	.661	Required
4.	Identify the type of ginger to plant.	3.27	.751	Required
5.	Prepare a financial plan.	3.29	.727	Required
6.	Prepare a production plan.	3.36	.773	Required
7.	Prepare a marketing plan.	3.33	.789	Required
8.	Determine appropriate planting time.	3.47	.726	Required
9.	Select suitable implement for ginger farming such as:			
	Hoe.	3.13	.944	Required
	Cutlass.	3.02	.941	Required
	Digging fork.	3.29	.787	Required
	Mattock.	3.20	.894	Required
	Spade.	2.96	.928	Required
	Knife.	3.00	.953	Required
	Axe.	3.07	1.031	Required
10.	Select suitable pesticides to control pest attack such as:			
	Sniper.	3.42	.723	Required
	Sharp shooter.	3.36	.802	Required
	Total.	3.39	.815	Required

The data in table 1 above revealed that all the 11 skill items in planning operation had their mean ranged between 2.96 and 3.49 which are higher than the bench mark of 2.50. This indicates that all the 11 skill items in planning for ginger production require training by Secondary School leavers. The standard deviation of all the items ranged from 0.661 to 1.031 which implies that the respondents were close to each other in their responses.

Research Question 2
What are the entrepreneurial skills needed by Secondary School leavers in pre-planting operations in ginger production?

Table 2: Mean responses of Secondary School leavers on entrepreneurial skills in pre-planting operations in ginger production.

Academic Journal of Agricultural and Horticultural Research
Vol.1, No.2; April-June-2021;
ISSN (5201 – 3992);
p –ISSN 7239 - 4203
Impact factor: 0.00

S/N	Items	Mean	Standard deviation	Decision
1.	Clear the land by felling trees.	3.58	.812	Required
2.	Clear the land by stumping.	3.53	.757	Required
3.	Brush the land by clearing grasses.	3.07	.963	Required
4.	Brush the land by burning of dirts.	2.67	.953	Required
5.	Apply farmyard manure before digging/ploughing the soil.	3.18	1.007	Required
6.	Dig the soil to a depth of 10-15cm.	3.40	.863	Required
7.	Raise beds of:			
	1m width.	3.46	.570	Required
	30cm height.	3.38	.747	Required
	50cm apart. (for raised bed making).	3.44	.813	Required
8.	Identify disease free rhizomes.	3.24	.773	Required
9.	Identify rhizomes free from pest attack.	3.31	.821	Required
10.	Cut the rhizomes into sets of 3-5cm.	3.24	.981	Required
11.	Treat the sets with pesticide (sniper, total or sharp shooter).	3.47	.786	Required
12.	Allow the treated sets to dry for at least a day before planting.	3.07	1.031	Required

The entire 12 skill items in pre-planting operation had their mean above the bench mark of 2.50. This is to say that all the 12 skill items in pre-planting operation for ginger production are required for training among Secondary School leavers.

Research question 3

What are the entrepreneurial skills needed by Secondary School leavers in planting operation in ginger production?

Table 3: Mean responses of Secondary School leavers on entrepreneurial skills in planting operations in ginger production.

S/N	Items	Mean	Standard deviation	Decision
1.	Make a hole of 8cm into the soil.	3.24	.981	Required
2.	Insert the set into the hole with the bud facing upwards.	3.27	.780	Required
3.	Cover the set in the hole with soil.	3.27	.751	Required
4.	Continue planting sets at a spacing of 30x30cm.	3.44	.659	Required
5	Properly use planting implements such as:			
	Hoe	3.29	.920	Required
	Cutlass	3.27	.837	Required

Academic Journal of Agricultural and Horticultural Research
Vol.1, No.2; April-June-2021;
ISSN (5201 – 3992);
p –ISSN 7239 - 4203
Impact factor: 0.00

Table 3 shows that all 5 skill items in planting operation are required for training of Secondary School leavers, this is because the mean of the skill items all are well beyond the bench mark of 2.50, so also the standard deviation shows that the students were not far from each other in their responses with the range of 0.659 to 0.981.

Research Question 4

What re the entrepreneurial skills required by Secondary School graduates on field maintenance operations in ginger production?

Table 4: Mean responses of Secondary School leavers on entrepreneurial skills on field maintenance operations in ginger production.

S/N	Items	Mean	Standard deviation	Decision
1.	Plant shade providing crops such as:			
	Okra.	3.20	1.014	Required
	Banana.	3.40	.863	Required
2.	Identify time of introduction of mulching materials.	3.36	.830	Required
3.	Mulch with green leaves at the rate of 15t/ha.	3.31	.900	Required
4.	Remove weeds using hands after 5-6 weeks of planting.	3.22	.902	Required
5.	Apply fertilizer (NPK 15:15:15) at the rate of four (4) bags/ha for first application.	3.27	.809	Required
6.	Apply pesticides (sniper) when pest attacks are discovered.	3.62	.576	Required
7.	Apply captan to control leaf spot disease.	3.64	.645	Required
8.	Apply fertilizer (NPK 15:15:15) at the rate of two (2) bags/ha for second application.	3.40	.939	Required

Table 4 shows that the mean ranging from 3.20 to 3.64 are above the bench mark of 2.50; this implies that all the 8 skill items on field maintenance operations in ginger production are required for training by Secondary School leavers.

4.2.5 Research Question 5

What are the entrepreneurial skills needed by Secondary School leavers in harvesting operations in ginger production?

Table 5: Mean responses of Secondary School leavers on entrepreneurial skills in harvesting operations in ginger production.

S/N	Items	Mean	Standard deviation	Decision
1.	Identify time of harvest of ginger:			
	Fresh ginger.	3.47	.786	Required
	Dried ginger.	3.49	.695	Required
	Planting materials.	3.42	.723	Required
2.	Brush the dry ginger leaves with cutlass.	3.11	.935	Required

3.	Use hoe to uproot the matured rhizome.	3.36	.645	Required
4.	Use digging fork to uproot the matured rhizome.	3.38	.912	Required
5.	Shake and remove the sand attached to the harvested rhizomes.	3.36	.743	Required
6.	Trim-off ginger roots with knife.	3.29	.787	Required
7.	Soak the harvested rhizomes in warm water to further clean the rhizomes.	3.53	.694	Required
8.	Select healthy ginger rhizomes for next planting season.	3.47	.661	Required
9.	Store the selected ginger rhizomes under shade.	3.29	.757	Required
10.	Properly cover the stored ginger rhizomes with dry grasses.	3.29	.843	Required

Table 5 has 10 skill items on harvesting operations whose mean are well above 2.50 the required bench mark. Also the range of the standard deviation from the table is 0.645 and 0.935 meaning that the students were not far from each other in their responses.

4.2.6 Research Question 6

What are the entrepreneurial skills needed by Secondary School leavers in processing of ginger products?

Table 6: Mean responses of Secondary School leavers on entrepreneurial skills in processing of ginger products.

S/N	Items	Mean	Standard deviation	Decision
1.	Scrape the bark of the rhizomes with knife.	3.47	.694	Required
2.	Split the ginger rhizomes with knife.	3.24	.933	Required
3.	Dry in a single layer under the sun for 20-30 days.	3.36	.712	Required
4.	Turn over the ginger under the sun to ensure proper drying.	3.24	.857	Required
5.	Ascertain the required level of drying.	3.24	.830	Required
6.	Bag the dried ginger for storage/marketing.	3.13	.919	Required
7.	Pound/grind the dried ginger into powdered form.	2.93	1.009	Required
8.	Store the product in a cool dry place.	3.27	.939	Required

Table 6 shows that the entire skill items on processing of ginger products are required for the development of entrepreneurial skills training module because their mean scores are above the bench mark of 2.50.

4.2.7 Research Question 7

What are the entrepreneurial skills needed by Secondary School leavers in marketing of ginger products?

Table 7: Mean responses of Secondary School leavers on entrepreneurial skills in marketing of ginger products.

S/N	Items	Mean	Standard deviation	Decision
1.	Identify a ready market for ginger products.	3.36	.830	Required
2.	Carry out market survey to know the best selling time.	3.27	.780	Required
3.	Carry out market survey to know the best selling price.	3.27	.780	Required

Academic Journal of Agricultural and Horticultural Research
Vol.1, No.2; April-June-2021;
ISSN (5201 – 3992);
p –ISSN 7239 - 4203
Impact factor: 0.00

4.	Advertise ginger products (fresh, whole dried, spilt dried and powdered ginger).	3.29	.727	Required
5.	Measure the ginger products into:			
	Bags for marketing.	3.29	.991	Required
	Basins for marketing.	3.33	1.000	Required
6.	Fix price for the products	3.44	.813	Required
7.	Keep records of sold products.	3.42	.753	Required
8.	Compare production cost and sales record to determine profit and losses.	3.51	.661	Required

Table 7 shows that all the 8 skill items in marketing of ginger products have their mean values above 2.50 (bench mark). This implies that all the skill items presented are skills that require training by Secondary School leavers. The standard deviation ranging from 0.661 to 1.00 meaning that the student's responses were clod to each other.

Discussions

The findings in table one (1) are in agreement with the view of Mgbeahurike (2001), who stated that planning competencies in an enterprise involves stating realizable objectives, preparing budget for the enterprise among others. Olaitan and Mama (2001) stated that, the skills in planning for farm operations are to formulate specific objectives for the farm, to decide on the farming system to adopt and so on. The opinion and report of the authors cited on skills items helped to justify the findings of this study in table one (1).

Findings from this study in table two (2) revealed that all the twelve (12) pre-planting skill items were required for training by youths in Wamba Local Government Area, they include; brush the land by clearing of grasses, dig the soil to a depth of 10-15cm identify disease and pest free rhizomes among others. These findings are in consonance with that of Stan (2016) who reported that, when getting a site to set up a cassava farm, pick an area with deep well drained loamy soil, identify a land with thick vegetation around it, prepare good seed beds, select a variety that is widely accepted in your target market, select healthy cassava stem cuttings and many more.

The study revealed that all ginger planting skills were needed for training by the youths in Wamba Local Government Area. Mathew (2018), in his report stated that before planting cassava, there is need to consider the land tillage method, time of the year and seed bed type, as planting within all the right conditions will ensure reaping a healthy harvest and will increase chances of good yield. His findings helps to justify the findings of this study with regards to table (3) three.

Table 4 revealed eight (8) field maintenance skills were required for training by Secondary School Leavers in Wamba Local government Area. The findings from table four (4) is in line with that of Titilope (2017) who stated that early weeding prevents weed from competing with the crop for nutrients, water, sunlight and space. She also reported that weeding should be done carefully in order to avoid uprooting the crop. The author further stated that two weeding are generally given to ginger. The first weeding just before second mulching and repeated depending on the intensity of weed growth and that the weeded material can be used for mulching.

Ginger crop is ready for harvest in about 8-10 months depending on the variety, when ginger is fully matured

the leaves turns yellow and the pseudo stem begins to dry. Titilope (2017) reported that matured rhizomes are lifted either with digging fork or with a spade after which the rhizomes are cleaned of roots and adhering soil particles. Titilope's report is in agreement with the findings of this study as with regards to table five (5).

The findings of this study from table six (6) on processing skills in ginger production is in agreement with that of Okonze and Ejiofor (2013) who reported that women farmers needed improvements in various aspects of cocoa processing enterprise which includes effective processing and marketing in order to ensure food security and improvements in cocoa production.

The findings in table seven (7) revealed that eight (8) skills were required in marketing of ginger products by youths in Wamba Local Government Area. These skills include; identify a ready market for ginger products, carry out market survey to know the best-selling time and price, fix prices for ginger products among others. The findings in table seven (7) were supported by Rajagopal (2007) and Onwuka (2003) who enumerated the competencies in marketing agricultural products as advertise for products, fix prices for products, find buyers and transfer ownership among others.

Conclusion

All the skill items on the questionnaire totaling 61were needed for training Secondary School leavers in ginger production. The study has specially developed a training module that could help the youth to shun social vices such as thuggery, prostitution, armed robbery, kidnapping, and drug trafficking and make them useful to themselves, depend less on their parents and be self reliant/employed. Finally the information from this study could be useful to future researchers as a reference point for further research work.

The study has contributed to the knowledge on entrepreneurial skills in ginger production in the following ways;

1. The study has helped provide information for administrators of skill acquisition centers which could be integrated into skills acquisition programs for the unemployed youths and interested individuals who would want to take up ginger production.
2. The study has helped provide information for agricultural extension agents on the entrepreneurial skills required /needed by Secondary School leavers which could be used in training farmers of ginger and others wishing to take up ginger farming.
3. The study provides information to teachers of agriculture in senior Secondary Schools on the entrepreneurial skills needed by Secondary School leavers in ginger production. The teachers could use the information in organizing programs for training of Secondary School leavers in ginger production.

5.3 Recommendation

1. Nasarawa state government should integrate the developed entrepreneurial skills training module in ginger production into the skills acquisition programs in order for unemployed youths to acquire the entrepreneurial skills in ginger production enterprise.
2. Ginger farmers should use the developed module to increase their level of production.
3. Schools of agriculture, department of agricultural science and agricultural education should establish demonstration farms in order to capture and sustain the interest of students in ginger production.

4. Curriculum planners should incorporate the identified skills into the curriculum of crop production as well as skills acquisition centers.
5. Copies of the developed module should be made available in the libraries for students who may take up interest in ginger production.
6. Entrepreneurs should make use of the module whenever they are conducting interviews to select qualified candidates in order to improve their production.

References

Entrepinoys, (2010). *Ginger Production with Cost Analysis*. Available at http://www.entrepinoys.com/ginger. Retrieved 4th June, 2010 2:13 am

Matthew, (2018).*16 Steps to Successful Cassava Cultivation.* Retrieved from https://armi.com.ng/

Mgbeahurike, M. N. (2001). *Skills Improvement Needs of Agricultural Science Teachers for Effective Management of school Farms in Secondary Schools in Imo State.*Unpublished Thesis, Department of Vocational Teacher Education, University of Nigeria, Nsukka.

NRCRI (2005). *Ginger Production Extension Bull.* National Root Crop Research Institute, 15 Umuahia Nigeria.Pp-6.

Okonze, J. A and Ejiofor, T. E. (2013).*Capacity Building Needs of Women Farmers in Cocoa Processing Enterprise for Food Security in Abia State.*Nigerian Vocational Association Journal 18(1) 226-236

Okwuowulu, P. A. (1997). Ginger (*Zingiberofficinale*): *An Update in its Production andChallenges for the future*. African Journal of Root and Tuber Crops 3 (1): 7–11.

Olaitan, S.O. & Mama, R.O. (2001).*Principles and Practice of School Farm Management.*Owerri, Cape publishers International Limited. Pp. 15-22

Onwuka, A. U. (2003). *Development of Entrepreneurship skills Training Module for Enhancing Youth Participation in Regulated Cassava Processing Occupation in South Eastern Nigeria.*Unpublished Thesis, Department of Vocational Teacher Education, University of Nigeria, Nsukka.

Rajagopal (2007).*Marketing Dynamics: Theory and Practice.*India New Age International Publishers.Pp 37-41.

Stan, E. (2016). *How to Start a Cassava Farm in Nigeria: A Comprehensive Business Plan.*Agriculture and Food. Retrieved on 2nd , July 2017 from https://startuptipsdaily.com/

Titilope, R. (2017). *Detail Business Plan and Proposal for Ginger Farming from Cultivation to Marketing.* Retrieved from https://thechangetrend.com/