



Perception and Practice of Organic Farming among Secondary School Teachers in Ahoada East Local Government Area of Rivers State, Nigeria

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Authors' contributions

This work was carried out in collaboration between the both authors. Author AGI designed the study, performed the statistical analysis, wrote the protocol, wrote the first draft of the manuscript and managed the literature searches. Author CBE carried out the field work and managed the analyses of the study. Both authors read and approved the final manuscript.

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ABSTRACT

The purpose of this study was to determine the perception and practice of Organic Farming (OF) by secondary school Agricultural Science teachers in Ahoada East Local Government of Rivers State, Nigeria. A descriptive design with a structured questionnaire was used for data collection. Ten out of the seventeen secondary schools in the Local Government Area were randomly selected and eight questionnaires per school were administered to the secondary school Agricultural Science teachers. The results indicated that majority (72.5%) of the teachers have been in the teaching profession for less than 10 years and most of them grew up in the semi urban/ urban setting, 40% aware of OF, 10% and 52.5% of the respondents agreed having high and moderate perception of OF respectively and seldom practice it. A greater percentage (85.9%) of the teachers agreed to practice OF, most planted crop in the schools is cassava (38.8%), majorly practiced intercropping and 31.2% of the respondents unwilling to inform their co-teachers of the benefits of OF. The respondents also accepted the need for elaborate knowledge and in-service training on OF, inadequate Agricultural Science curriculum to teach OF as well as better facilities and teaching methods.

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1. INTRODUCTION

Nigeria is one of the nations endowed with natural resources with a total area of 923,768 sq km of which 78% as at 2011 was used for agricultural purposes [1]. This vast land is fertile and cannot be allowed to remain fallow. Five reasons have been stated why farming in Nigeria cannot fail [2]. Those he asserted were:

- i. The country has a large population of over 170 million people which is more than twice the population of Zimbabwe and South Africa together and therefore has enough labour for farming.
- ii. The populace depends on staple food produced from farms in Nigeria and a greater proportion of Nigerians buy their farm produce from the market.
- iii. The Government is focusing on food production by assisting interested farmers to reduce food importation.
- iv. The Nigerian people like merriment more than other African countries and the foods used for such celebrations can feed four other African countries.
- v. When the country attains its full potential in farming, it becomes a great foreign currency earner than what it is now.

Food production for several decades before now in the country was the mainstay of the country's economic growth which was used to establish the first-generation Universities. Traditional agriculture was then practiced but there has been a shift to conventional agriculture. However, agriculture has become more technological, efficient and specialised and this will necessitate adoption of new ideas especially at the formative stages of secondary school students [3]. Conventional agriculture is not environmentally friendly which requires highly specialised systems with emphasis on high yields achieved due to the inputs and other off-farm purchases [4]. This author opined that it is these perceptions that are pushing the practice of conventional farming globally. Sustainable agriculture is still new in Nigeria and as such must be pursued vigorously to enhance food production [5]. Sustainable agriculture is a system that takes into cognizance the major needs of the present dwellers and preserves the resources for the next generation [6]. It was noted that it is not easy to implement it as

researchers and educators are not bordered about sustainable matters [7]. For sustainability to be achieved there is need to encourage agricultural research, extension and education programmes [8]. It has been observed that the relevance of sustainable agriculture must be clear to teachers who are the major players in the development of agricultural education curriculum [4].

In Nigeria, agriculture is known as a core curriculum subject. Part of the philosophy of agriculture in schools is the improvement of the rural environment by raising the living standard of the community and producing food which are of health benefits [9]. The West African Examination Council stated that among others the objectives of Agriculture at the Senior Secondary School level is to train students acquire basic knowledge and skills in agriculture and prepare students for occupation in agriculture [10]. This can be achieved with the availability of qualified agricultural science teachers, adequate classrooms, agricultural laboratory and school farms [11]. Researchers have stated the importance of school farms in Nigeria [12,13]. Some of these according to them are as a source of income to the school, transfer of knowledge, develop skills in students, changes in the students' view of the environment, receive greater personal association with the environment, stimulate student's interest in farming and a laboratory for research. This is further buttressed by other workers [11] who recorded the social benefits of school farms in Rivers State, Nigeria as it enables it to develop their farming skills, assist the students to have a good background to become future agriculturist, appreciate the profitability of farming within available technology among others. There is the idea that school prepares the individuals for employment hoping to solve all public and private dilemmas and this has led to secondary schools and Universities focusing on occupational preparation [14]. There are cases where some of these students come from farming communities where they practice traditional agriculture and these students have high expectation of modern agriculture which are not met due to the absence of school farms [15]. On the other hand, e also observed that students schooling in the urban areas lacked knowledge of agriculture and see their involvement in agriculture as a drudgery and unclean activity/vocation. School farms

should therefore be properly equipped with farm implements/tools, constant provision of farm inputs and adequate space for crops and livestock to be managed under the guidance of the teachers [16]. It was noted that in Rivers State most of the school farms lacked necessary farm structures and implements while in some cases these facilities are in total disrepair leading to the total neglect of the school farm [15]. Since these students are expected to transfer knowledge to their parents/guardians especially those from farming communities, it is worthwhile that they learn new technological innovations of which organic farming is one. This is why the teachers need to be well informed to practice organic farming. The most important function of the agricultural science teachers is to assist the students learn knowledge and skill in agriculture. The teacher should have adequate technical knowledge and skills in transmitting agricultural innovations.

Only few tertiary institutions in Nigeria are into teaching organic agriculture. Record has it that among the Nigerian Universities only the University of Abeokuta, Abeokuta, University of Calabar and Kebbi State University undertake courses in organic agriculture at the undergraduate levels [5]. It was revealed that only 31.3% of the agricultural science undergraduate students in Rivers State, Nigeria are aware of certified/organized organic farming though it is practiced by default [17]. These undergraduate students graduate with little information on organic agriculture and some of them will become agricultural science teachers and therefore have acquired little knowledge to transfer to their secondary school students. Both teachers and students are devoid of the knowledge of the social, environmental, health and safety benefits of organic agriculture. There is an increasing awareness in America of the social and environmental farm issues in the areas of safety of food and quality, ground and surface water pollution and the management of the natural resources [18]. There is an advocacy of the need on the availability of more information to teachers in the areas of sustainable agriculture and resource preservation [19]. Biovision Africa Trust, a non-governmental organization in Kenya asserted that students there upon accessing information on new innovations and technology like organic agriculture, pass these emerging trends to their parents/guardians and farmers in their areas [20]. A study was carried out to determine the perception of teachers in respect to teaching sustainable agriculture and the

degree of the knowledge and skills on sustainable agriculture that were taught by teachers in the North Central region of the United States of America [3]. The work revealed that the agricultural science teachers agreed on teaching sustainable agriculture but need adequate information and instructional materials on sustainable agriculture and inclusion of sustainable agriculture in the curriculum. A research was undertaken to analyse the awareness and perceptions of Home Economics secondary school teachers and students on organic farming methods and organic food in Malta [21]. The work showed that knowledge about organic farming was still very vague in the schools and could not remember the information accurately on organic farming for a long time.

Ahoada East Local Government Area (AELGA) is one of the 23 Local Government Areas making up Rivers State, Nigeria and is blessed with large expanse of land suitable for agriculture and has several secondary schools. This study aims at the perception and practice of organic farming by agricultural science teachers in the secondary schools in AELGA, Rivers State of Nigeria.

2. MATERIALS AND METHODS

The population for the study work consist of all the agricultural science teachers in the seventeen (17) secondary schools in AELGA. The study sample size was made up of eighty (80) agricultural science teachers that were randomly selected from ten (10) secondary schools and eight (8) teachers from each school were randomly selected for the study. The secondary schools selected were Upata 1 Community Secondary School, Edeoha, Upata 2 Community Secondary School, Odiabidi; Gospel International School, Ahoada; Light Foundation School, Ahoada; Western Ahoada County High School, Ahoada; Community Comprehensive Secondary School, Okporowo; Federal Science and Technical College, Ahoada, Community Secondary School, Ula-Upata; Comprehensive Secondary School, Odiemerenyi; and Government Secondary School, Ogbo.

The instrument used to collect data for the work was a structured questionnaire with question items to elicit relevant information in a question and answer format with options to choose. A multi-stage random sampling was used for the sampling method while data were analysed with the aid of descriptive statistical tools of frequency count and percentages.

3. RESULTS AND DISCUSSION

Table 1 revealed that majority (86.2%) of the teachers were diploma/degree holders in Agricultural Science with only 13.8% without a certificate in Agricultural Science while there are more male teachers (68.8%) than female teachers (31.2%). Other workers have noted a similar result of staff gender that teach agricultural science in the area under study [4,3]. However, among the community farmers in Rivers State there are more female farmers than male farmers [22-24].

A greater proportion of the teachers were married (67.5%) which was followed by widows/widowers (7.5%) with no single parent. Most of the teachers were within the age bracket of 36-45 years (52.5%) and the lowest as those who are either 25 years old or less while another work showed that majority of the agricultural science teachers were between 26 and 35 years old [3]. The distribution of the teachers by the number of years in the teaching profession showed a greater proportion of those with less than 10 years teaching experience (72.5%) while the least are those with more than 30 years'

experience (3.8%). This will not enhance effective and proper teaching by these younger teachers. A study revealed that longer experience in teaching leads to greater delivery of skills and knowledge to students [21]. Majority of the respondents agreed having farming experience (65.0%). It was posited that better skills are acquired with longer farming experience [25,26]. Only 27.4% of the teachers grew up from farming families while 41.3% were raised from semi-urban/urban areas. This is a pointer that their practicing organic farming by default from their background will be poor.

There is an average awareness of organic farming (40.0%) but a moderate perception (52.5%) among the agricultural science teachers in this LGA (Table 2). Only 21.3% of the respondents agreed using chemical fertilizers in their school garden while the frequency of practice of organic farming is seldom (51.3%) and only 33.8% practice it frequently. This indicates a low level of practice of organic farming by teachers in the schools from the study area. The commonest organic material used is mulch (51.3%) which they can easily obtain from

Table 1. Socio-demographic characteristics of secondary school agricultural science teachers in AELGA, Rivers State, Nigeria

Question items	Variables	No. of responses	% Response
Qualification of agric. science teachers	NCE	22	27.5
	NCE (outside Agric)	9	11.3
	B.Sc./B.Ed. (Agric)	47	58.7
	Any other	2	2.5
Gender	Male	55	68.8
	Female	25	31.2
Marital status	Single	8	22.5
	Married	54	67.5
	Divorced	2	2.5
	Widow/widower	6	7.5
	Single Parent	0	0.0
Age of agric. science teachers	≤25 years	6	7.5
	26-35 years	9	11.3
	36-45 years	42	52.5
	46-55 years	13	16.3
	56-65 years	10	12.5
No. of years in teaching profession	<10 years	58	72.5
	10-20 years	13	16.3
	21-30 years	6	7.5
	>30 years	3	3.8
Farming experience	Yes	28	35.0
	No	52	65.0
Where teachers grew up	Farming family	22	27.4
	Rural non-farm	25	31.3
	Semi-urban/urban area	33	41.3

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their farms. There is a greater willingness to practice organic farming (85.9%) while only 14.1% are not willing to continue in it. Their major source of information on organic farming is from the Television (28.8%) followed by Radio (23.8%) while the least source is from seminar/workshop (6.3%) and newspapers (7.5%). This indicates that the teachers are not given refresher courses or do not have the opportunity/unwilling to update their knowledge. It had been noted that news carried by the Nigerian Newspapers is insignificant on agricultural activities [27,28].

From Table 3, the most planted crop in the schools is cassava (38.8%) followed by maize (27.5%) while the least cultivated crop is yam (5.0%). It has earlier on been reported that cassava is the most cultivated crop in this LGA as it serves as a staple food when processed into various forms [29]. The most favoured farming practice adopted in the secondary schools is intercropping (47.5%) because of the numerous advantages followed by mixed farming while the least is shifting cultivation (6.4%).

Most of the agricultural science teachers are willing to inform their co-teachers of the need to practice organic farming (68.8%) while only 31.2% of them are unwilling to do so (Table 4). On the benefits and difficulties of practicing organic farming, 41.1% of the respondents indicated that there is a negative effect on the environment while 58.9% accepted a positive effect on the environment when chemical fertilizer is applied. On people's health, 54.5% accepted negative effect but 45.5% are of the view that it has positive effect on people's health and this has been attested to by other workers [30,31]. Greater proportion of the teachers accepted that organic farming enhances large scale food production (54.4%) while 45.6% do not agree. Several workers have reported of large scale food production when organic farming is practiced though the products are more expensive than food produced with the conventional agriculture. There is therefore need to educate these teachers on practicing sustainable agriculture so they can educate their students properly and the rural farmers in their vicinity.

Table 2. Practice and source of information of organic farming among secondary school agricultural science teachers in AELGA, Rivers State

Question items	Variable	No. of response	% Response
Aware of organic farming	Yes	32	40.0
	No	48	60.0
Perception of organic farming	Low	30	37.5
	Moderate	42	52.5
	High	8	10.0
Use of chemical fertilizers in school garden	Yes	17	21.3
	No	63	78.8
Type of fertilizer used for crop production	Chemical fertilizer	18	22.5
	Natural fertilizer	62	77.8
Frequency of practice of organic farming in school	Very often	27	33.8
	Seldom	41	51.3
	Never	12	15.0
Type of organic material used	Wood ash	12	15.0
	Mulch	41	51.3
	Green manure	13	16.3
	Crop waste	14	17.5
Will continue to practice organic farming in school	Yes	69	86.2
	No	11	14.1
Source of information of organic farming in school	Agric magazine	7	8.8
	Radio	19	23.8
	Television	23	28.8
	Internet	10	12.5
	When in tertiary institution	10	12.5
	Seminar/workshop	5	6.3
	Newspapers	6	7.5

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Table 3. Farming methods adopted among secondary school agricultural science teachers in AELGA, Rivers State, Nigeria

Question items	Variables	No. of response	% Response
Most planted crop in school	Maize	22	27.5
	Cassava	31	38.8
	Yam	4	5.0
	Vegetables	17	21.3
	Plantain/Banana	6	7.5
Types of farming practice adopted in school	Shifting cultivation	5	6.3
	Crop rotation	9	11.3
	Bush fallow	0	0.0
	Mixed farming	28	35.0
	Intercropping	38	47.5
Availability of land to practice organic farming	Yes	23	28.7
	No	57	71.3

*Field Report, 2016***Table 4. Benefits and difficulties of practicing of organic farming among secondary school agricultural science teachers in AELGA, Rivers State, Nigeria**

Question items	Variables	No. of response	% Response
Willing to inform co-teachers of the benefits of organic farming	Yes	55	68.8
	No	25	31.2
Chemical fertilizer on environment	Positive effect	47	58.9
	Negative effect	33	41.1
Chemical fertilizer on people's health	Positive effect	36	45.5
	Negative effect	44	54.5
Organic farming enhance large scale food production	Yes	43	54.4
	No	36	45.6
Reason for practicing organic farming	High crop yield	18	22.5
	Improve soil fertility	28	35.0
	Better food taste	13	16.3
	To control weeds	21	26.2
	Organic farming shallow knowledge	26	32.5
Constraints to practice organic farming	Scarcity of organic materials	10	12.5
	No interest	12	15.0
	Labour Intensive	4	5.0
	Expensive	8	10.0
	Difficult to apply	20	25.0

Field Report, 2016

Improvement of the soil fertility (35.0%) is the major reason advanced by the teachers for practicing organic farming while the least reason is that organic farming produces food with better taste (16.3%). The major constrain to the practice of organic farming is the shallow knowledge of organized/certified organic farming by these teachers while the least reason is the labour involved (5.0%). As stated earlier on, there is need for enlightenment campaign and training of the teachers on organic farming.

For organic farming to be developed in these schools, the respondents accepted that there is

need for elaborate knowledge on organic farming (85.0%) and 85.9% of them suggested that it could be achieved through in-service training programme (Table 5). Another worker also made this suggestion as a way of improving organic farming in secondary schools [3]. This is to ensure that the teachers are well informed so they can sufficiently transmit the knowledge and skills to their students. Majority of the agricultural teachers (78.8%) noted that the agricultural science curricula is inadequate to address the practice of sustainable agriculture while 11.2% stated that it is adequate. However, others have also advocated on the need to review the

Table 5. Ways of improving organic farming among secondary schools in AELGA, River State, Nigeria

Question items	Variables	No. of response	% Response
Need elaborate knowledge on organic farming	Yes	68	85.0
	No	12	15.0
Need in-service training of teachers	Yes	69	85.9
	No	11	14.1
Agricultural Science Curriculum adequate to teach organic farming	Yes	17	21.2
	No	63	78.8
Need for better facilities and methods of teaching sustainable agriculture	Yes	73	91.3
	No	7	8.7

Field Report, 2016

agricultural science curriculum in relation to sustainable agriculture [4,3]. Areas to be included in the curriculum by the teachers of Agriculture in North Central Region of USA include soil erosion control, soil testing, soil conservation, environmental protection and profitability [3].

These areas are completely lacking in the Agricultural Science curriculum for the secondary school students in Nigeria. Better facilities and methods of teaching sustainable agriculture was accepted by most of the teachers (91.3%). It has also been recommended that the production of teaching resources will assist in delivering the right messages with correct content for organic farming in Home Economics for secondary school students in Malta [21].

4. CONCLUSIONS AND RECOMMENDATIONS

The work showed that in AELGA there is an average awareness and moderate perception of OF among the agricultural science teachers in the study area. There is need to beef up the perception and practice of OF in the area by providing elaborate teaching of OF, review the Agricultural Science curriculum and include the teaching of sustainable agriculture in the curricular.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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