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Awareness and Practice of Organic Farming among Agricultural Science Undergraduate Students in Rivers State, Nigeria

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Abstract **– The practice of organic farming especially certified/organized is still young in Nigeria though most farmers practice traditional/sustainable agriculture using materials from organic origin. One of the major key players in agriculture in the country are the undergraduate agricultural science students who will after graduation work in agricultural production sectors or as teachers. They are agents of change and will need to be well acquainted with the adverse effects of conventional agriculture and see the need to practice organic farming. This research was therefore aimed at ascertaining if these undergraduates are aware of organic farming, determine their level of awareness, its practice and the factors militating against their practice of organic farming. One hundred and fifty (150) copies of well-designed structured questionnaires were administered to undergraduate students of agricultural science in three out of the four tertiary institutions in Rivers State, using a multi-stage sampling technique. The data collected were analyzed and results expressed in percentages. The work showed that the undergraduate students are mostly males and majority within the ages of 20-25 years, 72% are single, 80% are aware of organic farming but only 31.3% of them aware of certified/organized organic farming. Students most source of information on practice of organic farming is from the internet (26.7%) and 23.3% during lectures/tutorials and seldom practice organic farming. Major type of farming practice adopted is crop rotation, 39.3% use crop waste as the organic materials and the least use is wood ash (3.3%). Constraints to effective practice of organic farming are the much labour involved, poor knowledge and difficulty of application of organic materials. It is recommended that students interest in organic farming be motivated, discourage inorganic farming, enlightenment on the use of organic farming methods in the universities, and effective collaboration between OAPTIN, NOAN and the tertiary institutions and government support at the three tiers of governance**.

Keywords **– Awareness, Certified Organic Farming, Organic Farming, Practice, Undergraduate Students.**

I. INTRODUCTION

Nigeria with a population of over 170 million people is the most populous country in Africa and before the advent of the oil and gas industry depended mainly on agriculture for its economic growth (Olaito, 2014). Nigeria's first generation Universities (Universities of Ibadan, Lagos, Ife, Nigeria and Ahmadu Bello University) were established from proceeds of cocoa, oil palm and groundnut. In those days traditional agriculture was practiced which was an interdependent cycle between livestock, animal farming and crop farming and "this process works cyclically; livestock provide food for the family as well as manure, waste products can fertilize crops that in turn feed the family and the livestock" (Anon., 2014). This was a type of organic farming before the shift to industrial or conventional agriculture. Organic has been defined as the use of "farming practices that may be agroecological, sustainable or ecological; utilizing natural (non-synthetic) nutrient – cycling processes; exclude or rarely use synthetic pesticides; and sustain or regenerate soil quality" (Badgley *et.al.*, 2007). There is a high level of industrial or modern agriculture, a derivative of the Green Revolution globally practiced and that is what is basically taught in Nigerian tertiary institutions and in large commercial farms in the country. There is however, a universal great awakening on the benefits of organic farming in terms of conserving the soil, environmentally friendly and health wise. Abdullahi and Kutama, (2012) and Olaito, (2014) noted that organic agriculture is still very young in Nigeria while Harris (2006) stated that only few farms practice certified organic agriculture. Kutama *et al*. (2013) recorded that majority of the Nigerian farmers have only faint knowledge of organic farming and not aware of the dividends of organic farming. The report of Olaito (2014) stated that as at 2007, Nigeria had 3,154 ha of land under organic agriculture out of which 59 ha were fully converted. They further stated that by 2010, 11,979 ha were put into use on organic agriculture with 517 producers. Smaller African countries have been practicing organic farming while Nigeria with its population and size is yet to rise to this occasion. Aiyelaagbe, Harris and Trenchard (2011) noted that African countries such as Cameroon, Ghana, Kenya, South Africa, Tanzania and Uganda are quite ahead of Nigeria in producing certified organic food. Organic farming is practiced by more than 120 countries of the world (NOAN, 2010) and Nigeria cannot maintain an observed status. Though 70% of Nigerian farmers practice organic farming by default due to the high cost of agro-chemicals, this is not certified.

The major stakeholders of organic agriculture in Nigeria according to Olaito (2014) and Mgbenka, Onwubuya and Ezeano (2015) are:

- Dara/Eurobridge farm, the pioneer organic farm in Nigeria,
- Organic Agriculture Project in Tertiary Institutions in Nigeria (OAPTIN) that organized a pioneering work in 2004,
- Olusegun Obasanjo Centre for Organic Agriculture Research and Development (OOCORD) established in 2007,

- University of Abeokuta, Nigeria in conjunction with Coventy University, United Kingdom,
- Nigerian Organic Agriculture Network (NOAN) now known as Association of Organic Agriculture Practitioners of Nigeria formed in August 2008, and initiative of OOCORD.
- Nigeria Network for Awareness and Action for Environment (NINAAFE), a local NGO aiding small scale farmers to "create wealth from waste".
- Earth Care Nigeria Limited, a company that produced earth care compost plus to improve the soil fertility.
- Lautech Agricultural Services Limited, which is a Nigerian University company in partnership with the National Poverty Eradication Programme (NAPEP) that produces tropical fruits, herbs, mushrooms, spices, quail, guinea fowl, chicken, cane rats, snails, turmeric, lemon grass, etc. Food Basket of Nigeria is involved in the production of arable and cash crops in small holdings using organic materials. Other stakeholders are Organic Farmers Association of Nigeria, Organic Fertilizer Association of Nigeria, Nigeria GO organic, Ibadan GO Organic. Among these organizations OAPTIN and NOAN are key players to organic farming for both undergraduates and graduates agricultural students. OAPTIN focuses on capacity building, skill and technology development in organic agriculture. NOAN with the secretariat at the Department of Agronomy, University of Ibadan have four mandates, advocacy, capacity building, standards and certification, and marketing (Olaito, 2014; NOAN, 2010). They are to organize annual conferences where researchers from the tertiary and research institutes show case their findings while the bodies display their organic products. NOAN is expected to hold meetings and conferences periodically across the entire country with its activities to be rotated among the six geopolitical zones in Nigeria.

Some of the challenges of organic farming in Nigeria are lack of awareness of techniques, shortage and lack of training of extension staff on organic farming system, lack of technical knowledge and assistance, lack on information of activities, lack of research, lack of institutional support, difficulties in use of commercial organic fertilizer, inadequate capacity building (Mustapha, Bzungu and Sanusi, 2012; Mgbenka, Onwubuya and Ezeano; 2015). Sanni *et al.* (2010) reported that over 30 Universities, Polytechnics and Colleges of Education and private organizations are advancing organic farming after the organic agriculture movement started in Nigeria by the University of Agriculture, Abeokuta in 2004. A structured curriculum on organic agriculture was distributed to 50 Universities between 2007 and 2008 (Mgbenka, Onwubuya and Ezeano, 2015). They also reported that the University of Agriculture, Abeokuta, University of Calabar and kebbi State University undertake structured courses in organic farming at the undergraduate level from year 1 to year 5. Furthermore, OAPTIN had trained 23 fresh undergraduates in 7-week course under the aegis of their Work, Earn and Learn Programme (WELP) as well as an advanced programme for senior staff of the Ministry of Agriculture and University Lecturers in a summer programme. These programmes were held at the University of Agriculture, Abeokuta in conjunction with Conventry University, UK (Aiyelaagbe, Harris and Trenchard; 2011). OAPTIN have since 2004 being organizing Annual National Conference on Organic Agriculture. These are the only awareness for capacity building for students and indeed the Nigerian farmer on organic farming. Nigeria with about 70 Universities, 45 Polytechnics and 36 Colleges of Education require a very vigorous and aggressive training/exposure of our undergraduate students on organic farming to make a headway (JAMB, 2016).

The specific objectives of this research were to:

a) ascertain whether agricultural undergraduates students in Rivers State, Nigeria are aware of organic farming in course of their studies,
b) determine the level of practice of organic farming in their tertiary institutions,
c) determine the factors that militate against the awareness and practice of organic farming by agricultural undergraduate students in tertiary institutions in Rivers State and
d) create awareness and proffer solutions that will enhance effective practice of organic farming by agricultural undergraduate students in Rivers State.

II. Materials and Methods

Rivers State is one of the States in Nigeria and hosts four tertiary institutions where students study Agricultural Science at degree level. The population comprised undergraduate students from these institutions which are Rivers State University of Science and Technology, Nkpolu, Port Harcourt; University of Port Harcourt, Port Harcourt; Ignatius Ajuru University of Education Port Harcourt at its Ndele Campus and the Federal College of Education (Technical), Omoku. Students studying Agricultural Science at the undergraduate level from the last three institutions out of the four were used as sample for this research. A multi-stage sampling technique was used for this study because of the stages involved in selecting the respondents. Fifty students from each of these institutions were chosen for the purpose of the work study. Twenty five students each at levels 300 and 400 from each of the institutions were randomly selected making it a total of 150 students and administered with structured questionnaires to elicit information for the work. All the questionnaires were retrieved, the data analyzed and results expressed in percentage.

III. Results and Discussions

The socio-economic characteristics of the Agricultural Science undergraduate students are expressed in Table 1.

The result showed that 57.3% of the respondents were male showing male dominance in studying agricultural science. The higher number of males than those of females may be attributed to the issue of gender inequality in terms of students' enrolment in Nigerian institutions (Shu'ara, 2010). However, in practice farming activities in this part of the

Table 1: Socio-economic characteristics of Agricultural Science undergraduate students in Rivers State, Nigeria.

Question Items	No of responses	Percentage
Gender		
Male	86	57.3
Female	64	42.7
Age		
<20 years	22	14.7
20-25 years	84	56.0
26-30 years	32	21.3
>30 years	12	8.0
Marital Status		
Single	108	72.0
Married	34	22.7
Divorced	8	5.3
Widow/widower	0	0.0

Source: Field report, 2015

country and generally in Nigeria is dominated by females (Ojo, 2012). Majority of the students were within the age bracket of 20-25% (56.0%) showing a greater youth interest in studying agricultural science. Greater percentage (72%) of those studying agriculture are single and as such they can be more focused in their studies without much family life distraction.

Table 2 revealed that only 25.3% of the students had experience in farming before their admission to study agricultural science while 57.3% of their parents/guardians were farmers indicating that most of these undergraduate students did not have interest in the vocations of their parents/guardians. Awareness of organic farming was 80.0% but only 28.5% of them agreed having enough information on organic farming. Surprisingly the work showed that only 21.3% of the respondents were aware of certified organic farming. This is in line with the observations of Harrs (2006) and Mgbenka, Onwubuya and Ezeano (2015) that most Nigerian farmers practice organic farming by default but failed to carry out certified organic farming while AdeOluwa (2010) posited that organic farming in an organized manner is still at the embryo stage in Nigeria. Among the Universities in the country that only the University of Agriculture, Abeokuta, University of Calabar and Kebbi State University currently run structured courses in organic farming is quite worrisome (Mgbenka, Onwubuya and Ezeano, 2015).

Table 2: Awareness and source of information of organic farming by Agricultural Science undergraduate students in Rivers State, Nigeria.

Question Items	No of responses	Percentage
Experience of farming before admission		
Yes	38	25.3
No	112	74.7
Whether parents/ guardians farm		
Yes	86	57.3
No	64	42.7
Awareness of organic farming		
Yes	120	80.0
No	30	20.0
Have enough information on organic farming		
Yes	43	28.5
No	107	71.5
Aware of certified organic farming		
Yes	32	21.3
No	118	78.7

Source of information on organic farming		
Radio	10	6.7
Television	20	13.3
Lectures/Tutorials	35	23.3
Farm practice	28	18.7
Friends/relatives	10	6.7
Agric magazines/newspapers	7	4.7
Internet	40	26.7

Source: Field Survey, 2015

Lower degree of organic farming practice was noticed in the Universities (42.0%) from Table 3 while the frequency of such practice was seldom (61.3%). The students practice organic farming more during their industrial training (46.7%) thus achieving one of the benefits of industrial training which is to encourage the acquisition of skills in the industry that will be useful after graduation. The farming practices adopted by most of the students is crop rotation (48.7%) and

Table 3: Practice and organic farming methods by Agricultural Science undergraduate students in Rivers State, Nigeria.

Question Items	No of responses	Percentage
Practice of organic farming in school		
Yes	63	42
No	87	58
Frequency of practice of organic farming in school		
very often	19	12.7
Seldom	92	61.3
Not all	39	26.0
Types of farming practice adopted		
Crop rotation	73	48.7
Shifting Cultivation	2	1.3
Bush fallowing	3	2.0
Inter-cropping	66	44.0
Mixed farming	6	4.0
Major place of practice of organic farming		
School farm	60	40.0
During industrial training	70	46.7
Project/experimental plot	15	10.0
Any other	5	3.3
Type of organic material used		
Wood ash	5	3.3
Mulch	45	30.0
Green manure	26	17.3
Crop waste	59	39.3
Farm yard manure	15	10.0
Major crop type grown in the Universities		
Maize	40	26.7
Cassava	48	32.0
Yam	14	9.3
Vegetable	26	17.3
Plantain/Banana	20	13.3
Tree crop	2	1.3

Source: Field Survey, 2015.

intercropping (44.0%) while the least type was shifting cultivation (1.3%) followed by bush-fallowing (2.0%). Intercropping as one of the commonest type of farming practices adopted by these students is in line with the works of Iyagba and Ovai (2015) and Iyagba and Brown (2015) as the major type of farming practice adopted by farmers in some parts of Rivers State with advantages such as higher yield over mono cropping, preventing risk of crop failure and lower invasion of pests and diseases among other factors (Onwueme and Sinha, 1991). Shifting cultivation and bush fallowing is less attractive in the Universities perhaps due to the demand of land by these

farming practices. The major type of organic material used by these students is crop waste (39.3%) followed by mulch materials (30.0%) while the lowest source is from wood ash (3.3%). In as much as these materials are used for this purpose, there are other competitive uses such as fodder and fuel by farmers indicating their inadequacies as organic material on a large scale (Kutama *et al;* 2013). However, when used they are capable of improving the physical properties, biological status and prevent soil erosion. The major crop grown in the Universities is cassava (32.0%) and followed by maize (26.7%) while the least cultivated crop are tree crops. This may still be connected with the farm size required to cultivate tree crops.

Majority of the respondents (57.3%) indicated unavailability of adequate organic materials for organic farming (Table 4). This is in agreement with the earlier submission of Kumata *et. al*. (2013) that the available organic materials to farmers is inadequate due to other competitive needs on the farm while others are subject to destruction by termites. Majority of these agricultural science students (98.7%) agreed of the need for elaborate knowledge on organic farming indicating a willingness, a pointer that there is hope for organic farming in the country. The major barriers on the use of organic farming are the labour involved (26.7%) and poor knowledge of the methods (20.0%). Labour is involved in preparing organic materials for organic farming and the higher presence of weeds in organic farming will require extra labour for weeding. Difficulty of application (16.0%) is another barrier expressed by the respondents and this is related to the offensive odour of the commercial organic fertilizer and the method of application (Alimi, Ajewole, Olubode-Awosola and Idowu, 2006).

Table 4: Constraints to organic farming by Agricultural Science undergraduate students in Rivers State, Nigeria.

Question Items	No of responses	Percentage
Availability of adequate organic materials used for organic farming		
Yes	64	42.7
No	86	57.3
Reasons for unavailability of organic farming materials		
Poor knowledge on their preparation	38	25.3
Too much labour involved	30	20.0
Lack of organic materials	78	52.0
Any other reason	4	2.7
Need for elaborate knowledge on organic farming		
Yes	148	98.7
No	2	1.3
Barriers on the practice of organic farming		
Poor knowledge of the methods	30	20.0
Lack of interest	2	1.3
Too much labour involved	40	26.7
Expensive	12	8.0
No government encouragement	18	12.0
Difficulty of application	24	16.0
Scarcity of organic materials	14	9.3
Bulkiness of materials	10	6.7

Source: Field report, 2015

The respondents believed that practice of organic farming is beneficial, 94.7% on people's health and 92.0% on the environment (Table 5). This is can be attributed to the fact that organic farming utilizes refuse and wastes produced in the environment resulting to healthy food and organic farming and is also known to be environment friendly (Dipeolu, Philip, Aiyelaagbe, Akinbode and Adedokun, 2009). On the area of agricultural production, 45.3% of the respondents indicated greater benefit of organic farming on increase in crop yield while few (4.0%) stated that the benefit derived was the safety of the environment. From their basic soil science studies they should be aware that organic materials supply enhanced biological and

Table 5: Benefits of organic farming by Agricultural Science undergraduate students in Rivers State, Nigeria.

Question item	No of responses	Percentage
Use of chemical/input on people's health		
Positive effect	142	94.7
Negative effect	8	5.3
Use of chemical input on the environment		
Positive effect	138	92
Negative effect	12	8
Benefits derived from organic farming		
Controls pests and weeds	72*	16.0
Increase in crop yield	204	45.3
Improves soil fertility	126	28.0
Increase in livestock production	30	6.7
Not harmful to the environment	18	4.0
Other benefits derived from organic farming		
Financial benefits	40	26.7
Health benefits	60	40.0
Social benefits	12	8.0
Environmental benefits	38	25.3

Source: Field report, 2015; * Multiple responses

physical storage mechanism to soils and decrease the risk of over fertilization thus making farmers to search for the dividends of organic farming (Burton, Rigby and Young, 1999). On the other benefits derived from organic farming, 40.0% of them indicated the health benefits as being greater than the rest. Reports by Nwajiuba and Akinsanmi (2002) and Nwachukwu (2010) revealed that products of organic farming help in the control of non-communicable diseases, have higher nutritional quality and micro-nutrients available than the non-organic foods produced.

IV. Conclusion and Recommendation

There are several benefits of organic farming. Although there is high awareness of organic farming which is practiced seldomly but an inadequate knowledge of it especially on certified organic farming among undergraduate students studying agriculture in this part of the country will cause a slow rate its adoption. There are several hurdles to cross in the areas of capacity building, advocacy, information dissemination and curriculum development for the practice of organic farming on a large scale by undergraduate agricultural science students. NOAN, OAPTIN and the Agricultural Research Council of Nigeria, other stakeholders in organic farming are called upon to organize seminars, conferences to create awareness and its practice and a definite policy on organic farming by the Federal Government.

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