

## Training Needs Assessment of Practitioners of Ecological Organic Agriculture in Southwestern Nigeria

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### Abstract

Challenges associated with conventional agriculture such as continuous use of toxic substances (fertilizers, pesticides and insecticides) is worrisome, therefore, there is need to focus on organic agriculture due to its numerous benefits. Meanwhile, training is germane to practising organic agriculture. Hence, practitioners across the value chain should be probed on their desire for training on organic agriculture in order to achieve the accrued benefits. The study assessed training needs of practitioners about Ecological Organic Agriculture (EOA) practices in South-west, Nigeria. Objectives measured are personal characteristics, source of information, knowledge, training needs and constraints faced in practicing EOA. Data were collected using structured questionnaire from 150 respondents (farmers, marketers and extension agents) selected using multistage sampling procedure. Data were analysed using descriptive and inferential (Pearsons Product Moment Correlation and ANOVA) statistics. Majority of the respondents (66.7%) had tertiary education. Respondents ranked neighbour first among other sources of information with weighted score of 105.4, grading and marketing of organic produce (268.6) was equally ranked first among other training needs subject matter. Similarly, inadequate information on Ecological Organic Agriculture Standard (237.3) was ranked first among constraints faced in practising EOA. Practitioners' training needs (64.0%) and knowledge (62.0%) about EOA practices were high. Respondents' training needs ( $F = 171.03, p = 0.00$ ) were significantly different. In conclusion, high desire for training and difference in needs among practitioners could be associated with inadequate information on ecological organic agriculture standard and high cost of organic fertilizer. Therefore, training need is highly recommended based on each practitioner's specific needs.

**Keywords:** Training needs, practitioners, Ecological Organic Agriculture (EOA), and source of information.

### Évaluation Des Besoins En Formation Des Professionnels de L'agriculture Écologique Biologique Dans Le Sud-ouest du Nigéria

#### Résumé

Les défis associés à l'agriculture conventionnelle, tels que l'utilisation continue de substances toxiques (engrais, pesticides et insecticides) sont inquiétants. Il est donc nécessaire de se concentrer sur l'agriculture biologique en raison de ses nombreux avantages. Cependant, la formation demeure la clé essentielle de la pratique de l'agriculture biologique. Par conséquent, les praticiens intervenant sur toute la chaîne de valeur devraient être interrogés sur leurs besoins en formation en agriculture biologique afin de consolider les acquis et d'optimiser les avantages. L'étude s'est penchée sur l'évaluation des besoins en formation des praticiens de l'agriculture écologique et biologique (EOA) dans le Sud-ouest du Nigéria. Les indicateurs pris en compte sont les caractéristiques personnelles, la source d'informations, les connaissances, les besoins en formation et les difficultés rencontrées dans la pratique de l'EOA. Les données ont été collectées à l'aide d'un questionnaire élaboré et administré à 150 personnes (agriculteurs, distributeurs et agents de vulgarisation) sélectionnés par un modèle d'échantillonnage de plusieurs phases. Les données ont été analysées à l'aide de statistiques

descriptives et inférentielles (corrélation Pearsons Product Moment et ANOVA). La majorité de nos enquêtés (66.7%) avaient suivi des études supérieures. De leur classification, il ressort que les voisins occupent le premier rang avec un score pondéré de 105,4 au même titre que la place et la commercialisation des produits biologiques (268,6) par rapport aux autres besoins en formation. De même, l'insuffisance d'information sur la norme d'agriculture écologique biologique (237.3) a été classée première parmi les contraintes rencontrées dans la pratique de l'AEB. Les besoins en formation des praticiens (64,0%) et les connaissances (62,0%) sur les pratiques d'AEP étaient élevées. Les besoins en formation des répondants ( $F = 171,03, p = 0,00$ ) étaient significativement différents. En conclusion, le désir élevé de formation et la différence de besoins des praticiens pourraient être associés à une information inadéquate sur les normes de l'agriculture écologique biologique et au coût élevé des intrants biologiques. Par conséquent, les besoins en formation sont fortement recommandés en fonction des besoins spécifiques de chaque praticien.

**Mots-clés:** besoins en formation, praticiens, agriculture écologique et biologique et source d'information

## Introduction

Africa, particularly Sub-Saharan Africa, faces unprecedented challenges of providing sufficient and quality food for its ever increasing population projected to exceed two billion by 2050. This is in spite of the fact that agriculture is the major driver of most African countries' economies and source of livelihood for over 70% of their populace.

Contributing to this mismatch of potentials and need are multiple factors, which include climate change effects, degradation of the natural resources (particularly soil and water), and loss of biological diversity. Others are destruction of arable land resulting from human settlement, as well as desertification and extreme weather conditions including prolonged frequent droughts.

Meanwhile, organic agriculture has been found to encourage integrated, humane, environmentally and economically viable agricultural systems in which maximum reliance is placed on locally or farm-derived renewable resources, and the management of ecological and biological processes. Ecological Organic Agriculture is a production system, based on renewal of ecological processes and strengthening of ecological functions of farm ecosystem to produce safe and healthy food sustainability (Environment, 2010). Organic Agriculture represents a deliberate attempt to make the best use of local natural resources.

According to IFOAM (2009), researches have shown that ecologically-based organic production systems are capable of ensuring and sustaining local food security and sovereignty, ecosystem services for rural welfare and biodiversity conservation through increased uptake of agro-ecological

innovations, practices and technologies. Convention on Biological Diversity (CBD), (2001) recognizes the importance of traditional knowledge in the conservation and sustainable use of agricultural biodiversity. United Nations Environmental Programme (UNEP), also recognizes the vital role of bio-cultural diversity as the fourth pillar in sustainable development. The smallholder farmers are often pitted against large-scale holders and outside investors who receive preferential state support, despite strong evidence that the former are more equitable and more efficient in the use of their resources per unit area of land (IFOAM, 2007).

The keys to economic development of any developing country (Nigeria inclusive) lie greatly in improving agricultural productivity (Gurung, 2006). The use of toxic substances such as fertilizers, pesticides and insecticides are impediment to human health and environment, Soil degradation, erosion, among others are some of the problems of conventional agriculture. Despite prospective benefits of organic agriculture in improving farming and food security, farmers, marketers and consumers still practice conventional agriculture which pose a great danger to the farming lots and the Nigerian economy. This condition is worrisome and it is against this backdrop that this study was carried out to investigate training needs of EOA practitioners (farmers, extension agents and marketers) in the value chain.

## Objectives of the study

The main objective of the study was to determine the training needs of EOA practitioners along the

value chain, while the specific objectives are to;

- i. identify sources of information of the respondents about EOA;
- ii. ascertain respondents' knowledge level about EOA;
- iii. determine constraints to use of EOA practices;
- iv. ascertain relationship between respondents' knowledge and training need on EOA practices; and
- v. determine the difference between practitioners' training need about ecological organic agriculture.

### Materials and Methods

The study was carried out in Southwest, Nigeria. The respondents were practitioners involved in EOA (smallholder farmers, extension agents and marketers). A purposive sampling procedure was used to select Oyo, Ekiti and Osun states from the six Southwest States in Nigeria. This is because the selected States seem to have more concentration of organic farmers than other states in Nigeria. Simple random sampling procedure was used to select 25 farmers, 15 extension agents, and 10 marketers from each state. In all, 150 respondents were interviewed. Data were collected with the use of structured questionnaire and analysis was carried out using both descriptive and inferential (Pearsons Product Moment Correlation and ANOVA) statistics.

Training needs of the respondents about EOA were measured by providing them with 17 items on subject matter of EOA practices that practitioners might need training on. Respondents were asked to indicate whether their needs were high, moderate, low or not a need at all (not needed) on each item. A score of 3 was assigned to response option high, 2 was assigned to moderate, 1 to low and 0 to not needed. The minimum score was 0 and maximum was 51. Weighted scores were determined for each subject matter that respondents need training on, and ranked them accordingly. The highest weighted score was ranked first while the lowest was ranked least. Also training needs index was generated and mean was computed from the training needs index. This mean was then used as a benchmark to divide training needs into high and low category.

Practitioners' personal characteristics such

as state, age, sex and years of work experience were measured at ordinal, nominal and interval levels of measurement as the case dictated. Respondents were provided with a list of sources of information about EOA and were asked to tick from a three type scale of always, occasionally and never. A score of 2 was assigned to Always, 1 to occasionally and 0 was assigned to never response option. The maximum score was 22 and the minimum was 0. Thereafter, weighted score was generated for each information source item, which was used to rank the respondents' information sources accordingly. The item with the highest weighted score was ranked first among other information sources, while the least was ranked lowest.

Respondents' knowledge on EOA was determined by providing respondents with statements about EOA practices with a dichotomous response options of true or false. The correct answer was assigned a score of 1 while the incorrect answer was assigned 0. The maximum score was 21 and the minimum was 0. An index was generated and the mean was determined from the knowledge index. This mean was then used as a benchmark to categorize knowledge of respondents about EOA as low and high. To measure constraints, a list of factors that could affect the use and practice of EOA components were generated and respondents were asked to indicate the most severe constraints to them from response options of, not a constraint, mild constraints or severe constraints. Then weighted score was calculated and used to rank each item of constraint. The highest weighted score was ranked first and *vice-versa*.

### Results and Discussion

Findings (Table 1) reveal that majority (54.6%) of the respondents were between the age bracket of 41 and 60 years, 73.3% were male, 81.3% were married and 42.7% had 1 – 10 years work experience. This implies that many of the respondents are adult in their active age, male, married and they are well experienced in their choice of careers. It was also revealed that 66.7% of the respondents had tertiary education qualification (Table 1). This implies that many of the respondents are educated and may not likely have problems dealing with the ecological organic agriculture principles.

**Table 1:** Distribution of respondents by their characteristics (n = 150)

Characteristics	Category	Percentage
Age categories	21 – 40	35.4
	41 – 60	54.6
	61 and above	10.0
	Total	100
Sex	Male	73.3
	Female	26.7
	Total	100
Marital status	Single	13.3
	Married	81.3
	Widowed	2.0
	Divorced	3.4
	Total	100
Educational status	No formal education	6.0
	Primary education	12.7
	Secondary education	14.7
	Tertiary education	66.7
	Total	100
Years of work experiences	1 – 10years	42.7
	11 – 20years	30.0
	21years and above	27.4
	Total	100

Results from Table 2 show that respondents heard about organic agricultural practices from many sources, of which neighbour was ranked first with the highest weighted score of 105.4, and this is followed by print media (99.3), family and friends (91.4), television (90.1) and radio (88.6). This indicates that respondents are well exposed

to different sources of information about ecological organic agriculture. This is also an indication that the practitioners acquire information through verbal communication with neighbours, family and friends. They also sourced information from the mass media like the print media, television and radio, in order to add to their existing knowledge. This is corroborated by earlier findings from a research conducted by Oguntade (2009) that neighbours, family and friends are the leading sources of agricultural information to farmers, followed by radio, television and telephone.

It was revealed in the study (Table 3) that respondents had high knowledge about organic agriculture (62.0%). This result indicates that the respondents are knowledgeable in one way or the other about organic agriculture. First of all, high knowledge could positively affect practitioners' attitude about organic agriculture and its production. This is supported by the findings of Oyesola and Obabire (2011) that good knowledge of respondents on organic farming could influence them to convert from the conventional farming system to organic food production. However, the fact that practitioners are knowledgeable about organic agriculture does not connote that their knowledge of EOA should or could not be updated because research on organic agriculture is evolving day by day.

**Table 2:** Distribution of respondents' information sources about EOA (n = 150)

Source of information	Never %	Occasionally %	Always %	Total	Weighted score
Neighbours	29.3	36.0	34.7	100	105.4
Print media	38.7	23.3	38.0	100	99.3
Friends and family	31.3	46.0	22.7	100	91.4
Television	34.7	40.7	24.7	100	90.1
Radio	32.7	46.0	21.3	100	88.6
Training or workshops	36.7	44.0	19.3	100	82.6
Internet	53.3	26.7	20.0	100	66.7
Seminar	56.7	22.7	20.7	100	64.1
NOAN	55.3	32.7	12.0	100	56.7
Mobile phones	54.7	36.7	8.7	100	54.1
Fellow farmers	68.7	18.7	12.7	100	44.1

**Table 3:** Knowledge distribution of respondents on some EOA practices (n = 150)

Knowledge on Ecological Organic Agriculture		False	True	Level of knowledge
I.	Organic fertiliser is the same thing as organo-mineral fertiliser	61.3	38.7	(62.0) High
II.	Ecological organic agriculture involves planting of leguminous/cover crops to reduce soil erosion and increase soil nutrients	8.7	91.3	
III.	Weed management systems such as plant extracts and use of cover crop are not allowed in ecological organic agriculture	68.0	32.0	
IV.	Mechanization is not allowed in ecological organic agriculture	67.3	32.7	
V.	Two to three years is the conversion period from conventional to organic agriculture	45.3	54.7	
VI.	Ecological organic agriculture causes land degradation	84.7	15.3	
VII.	Organic agriculture makes use of bush fallowing to replace lost nutrients	8.7	91.3	
VIII.	Organic farming is closer to or the same as traditional farming	19.3	80.7	
IX.	Application of compost to increase soil fertility is an ecological organic practice	10.7	89.3	(38.0) Low
X.	Pests can be controlled through crop rotation system in organic agriculture	11.3	88.7	
XI.	Organic agriculture permits a minimal usage of synthetic fertilisers	58.7	41.3	
XII.	Organic fertiliser is not the same thing as organo-mineral fertiliser	43.3	56.7	
XIII.	Ecological organic agriculture involves the use of off-farm organic wastes	19.3	80.7	
XIV.	Organic farming is closer to or the same as traditional farming	12.0	88.0	
XV.	Ecological organic agriculture involves the use of animal manure such as cow dung, goat and poultry droppings	9.3	90.7	
XVI.	Ecological organic agriculture ensures sustainability of the ecosystem.	4.7	95.3	
XVII.	Organic agricultural practices has its principles and guidelines	6.7	93.3	
XVIII.	Ecological organic agriculture can also increase environmental pollution	68.7	31.3	
XIX.	Mulching is used in organic agriculture to control leaching of soil nutrients	9.3	90.7	
XX.	Ecological organic agriculture principles allow the use of cultural pest control like mixed cropping and shifting cultivation	12.7	87.3	
XXI.	Organic farming includes the use of synthetic fertilisers	81.3	18.7	

Results in Table 4 show that respondents need training in all areas of subject matter of organic agriculture and respondents' needs were high (64.0%) in the selected subject matter of ecological organic agriculture. It was also revealed that practitioners ranked grading or packing and marketing of organic produce first with weighted score of 268.60 among other subject matter of ecological organic agriculture that they needed training on. This is immediately followed by biological method of pest and disease control (267.60), credit source (267.30), storage methods and procedures (263.90), bio-fertilisers (259.30) and seed treatment (256.10).

The implication is that practitioners are in need of training in all subject matter of ecological organic agriculture, but particularly on postharvest

activities, processing and storage procedure, assessing credit for organic agriculture production, seed treatment and fertilizer application among others. That respondents still indicate need for training despite their high knowledge of organic agriculture, could be attributed to the fact that they want to be updated as organic agriculture evolves. This becomes important because the more they are exposed to training, the better they perform in organic farming. In turn, this enhance their production of acceptable organic produce, thereby boosting Nigerian economy. This corresponds with the findings of Okanlawon (2014) and Olajide, (2009) that there is the need for more training on organic agricultural practices for practitioners in Oyo and Osun states.

**Table 4:** Responses to training needs about ecological organic farming components (n = 150)

	Subject matter of training needs	Not needed	Low	Moderate	High	Weighted Score	Level of Training need
I.	Grading or packing and marketing of organic produce	0.7	8.0	13.3	78.0	268.6	
II.	Biological method of pest and disease control	1.7	6.7	14.2	77.5	267.6	
III.	Credit source	0.0	6.0	20.7	73.3	267.3	
IV.	Storage methods and procedures	0.7	8.0	18.0	73.3	263.9	
V.	Bio-fertilisers	0.8	10.8	16.7	71.7	259.3	
VI.	Seed treatment	1.3	8.0	24.0	66.7	256.1	
VII.	Green manure or green leaf manure	0.0	10.0	25.0	65.0	255.0	(64.0) High
VIII.	Current and future marketing	0.0	8.7	28.7	62.7	254.2	
IX.	Market locations	0.7	7.3	30.0	62.0	253.3	(36.0) Low
X.	Weed control	2.5	11.7	16.7	69.2	252.7	
XI.	Bio-dynamic farming	1.7	15.8	14.2	66.7	244.3	
XII.	Compost application	4.2	12.5	19.2	64.1	243.2	
XIII.	Record keeping and certification standards	0.7	10.7	34.0	54.6	242.5	
XIV.	Bio-rational pest and disease management techniques	1.7	14.2	29.2	55.0	237.6	
XV.	Land preparation	10.7	7.4	17.2	64.8	236.2	
XVI.	Composting or vermin-composting	1.7	21.7	22.5	54.2	229.3	
XVII.	Crop rotation	10.8	11.7	40.0	37.5	204.2	

Results in Table 5 reveal that environmental hazards (such as erosion, fire outbreak) were ranked first with a weighted score of 272, among other constraints. This is followed by inadequate information on ecological organic agriculture standard/principle (237.3) and expensive materials for making organic fertilizer (236.5). Unfriendly

odour or smell of organic products (236.1) was followed by laborious practice involved (235.8) in that order of magnitude. It was also revealed that all these constraints identified by the respondents were severe. The implication is that environmental hazards, inadequate information on ecological organic agriculture standards, high cost of organic

**Table 5:** Distribution of respondents based on constraints faced in practicing EAO (n = 150)

	Constraints to ecological organic agriculture practices	Not a constraint	Mild constraint	Serious constraint	Weighted score
I.	Environmental hazards such as erosion, fire outbreak	8.0	12.0	80.0	272.0
II.	Inadequate information on Ecological Organic Agriculture Standard/Principle	14.0	34.7	51.3	237.3
III.	Expensive materials for making organic fertilisers	8.2	47.1	44.7	236.5
IV.	Unfriendly odour or smell of organic manure	14.6	34.7	50.7	236.1
V.	Laborious practice involved	17.5	29.2	53.3	235.8
VI.	Ecological organic agriculture disseminating is time consuming	14.2	43.3	42.5	228.3
VII.	Lack of fund to train farmers	26.7	19.2	54.2	227.7
VIII.	Bulkiness of organic materials	32.0	14.6	53.3	221.1
IX.	Lack of technical know-how	14.7	53.3	32.0	217.3
X.	Materials to teach ecological organic agriculture are not readily available	20.8	43.3	35.8	214.8
XI.	Low or poor yield of organic products	20.0	48.0	32.0	212.0
XII.	Lack of capital	30.7	30.7	38.7	208.2
XIII.	Marketing of organic product is difficult	30.5	34.3	35.2	204.7
XIV.	Materials for making organic manure are not readily available	22.7	50.7	26.7	204.2
XV.	Difficulty in application of manure	18.3	60.8	20.8	202.3
XVI.	Difficulty in pest control	26.7	47.6	25.7	199.0
XVII.	Ecological organic agriculture disseminating is time consuming	93.7	0.0	6.3	112.6

fertilizers and laborious practice involved in organic agricultural production are the challenges faced by the practitioners involved in it. It implies that the severity of these challenges is on a high side.

It was indicated in Table 6 that years of schooling of the practitioners ( $r = -0.20, p = 0.01$ ) were significantly but negatively related to their training need. The implication is that the higher the number of years practitioners spent in school, the lesser or lower the training needed on ecological organic agriculture. That is, as the respondents' years of schooling is increasing, their training need is decreasing. Table 6 reveals that practitioners' knowledge ( $r = -0.21, p = 0.01$ ) was significantly but inversely related to their training need. This implies that the more knowledgeable the respondents are about EOA practices, the less training they need. Therefore, this dictates that years of schooling and knowledge about EOA practices will improve practitioners along the value chain of ecological organic agriculture.

Table 7a shows that test of difference between practitioners' training needs was significant ( $F = 171.03, p = 0.00$ ). This implies that the practitioners (farmers, extension agents and marketers) differed in their needs for training about EOA practices while Table 7b (LSD) further explained how the practitioners differed to each other in their

training needs. A significant difference existed between training needs of extension agents and marketers as well as marketers and farmers, with mean differences of 25.26 and 25.37 respectively.

### Conclusion and recommendation

Practitioners' sources of information about ecological organic agriculture were neighbour, family and friends, print media, television and radio. Although, practitioners are very knowledgeable about ecological organic agriculture practices, they however still need training on postharvest activities, processing and storage procedure, assessing credit for organic agriculture production, seed treatment and fertilizer application, among others. Their desire for trainings is to get updated as organic agriculture develops. However, these needs could be associated with inadequate information on ecological organic agriculture standard, high cost of organic fertilizer and laborious practice in organic practices. Therefore, training need is highly recommended based on each practitioner's need. This is very important as their needs differ greatly on EOA subject matter. Whenever any training is being organised attention should be paid to the identified challenges and adequate measures should be incorporated into the intended training.

**Table 6:** PPMC analysis of the relationship between selected respondents' personal characteristics, knowledge and their training needs

Variables	r- value	p-value	Decision
Training need index * Age of respondents	-0.05	0.56	Not significant
Training need index * Years of schooling of respondents	-0.20	0.01	Significant
Training need index * knowledge index	-0.21	0.01	Significant

**Table 7a:** Test of difference (Analysis of variance) between respondents' training needs

Source of variation	Df	F-value	p-value	Decision
Between groups	2	171.03	0.00	Significant
Within groups	147			

**Table 7b:** Distribution of practitioners by Post hoc (LSD) test of difference of training needs

Respondents category	Respondents category	Mean difference	p-value	Decision
Extension Agent	Farmers	0.11	0.93	Not significant
Extension Agent	Marketers	25.26	0.00	Significant
Marketers	Farmers	25.37	0.00	Significant

\*Significant  $p \leq 0.05$

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